MTNC030834A1
B01/B05

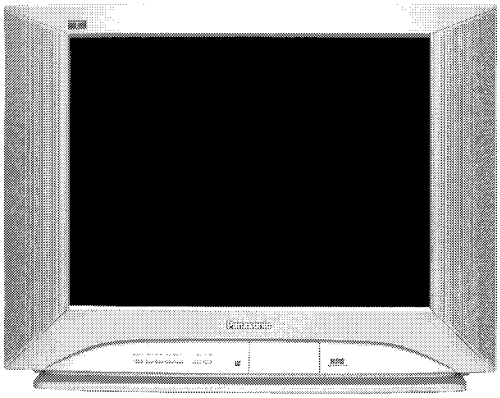
# Service Manual

## Color Television

Simplified

# CT-20SL13G
# CT-24SL13G
# CT-24SL13UG

NA10



**This simplified service manual is issued to add listed models to the main service manual order No. MTNC030623C1(CT-25L8G). A complete parts list and schematics are included in this simplified service manual. Please file and use this simplified service manual together with the main service manual Order No. MTNC030623C1(CT-25L8G).**

### ⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

### IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

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# 1 Safety precautions

**General guidelines**

An isolation transformer should always be used during the servicing of a receiver whose chassis is not isolated from AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect the receiver from being damaged by accidental shorting that may occur during servicing.

When servicing, observe the original lead dress, especially in the high voltage circuit. Replace all damaged parts (also parts that show signs of overheating.)

Always replace protective devices, such as fish paper, isolation resistors and capacitors, and shields after servicing the receiver. Use only manufacturer's recommended rating for fuses, circuits breakers, etc.

High potentials are present when this receiver is operating. Operation of the receiver without the rear cover introduces danger for electrical shock. Servicing should not be performed by anyone who is not thoroughly familiar with the necessary precautions when servicing high voltage equipment.

Extreme care should be practiced when handling the picture tube. Rough handling may cause it to implode due to atmospheric pressure. (14.7 lbs per sq. in.). Do not nick or scratch the glass or subject it to any undue pressure. When handling, use safety goggles and heavy gloves for protection. Discharge the picture tube by shorting the anode to chassis ground (not to the cabinet or to other mounting hardware). When discharging connect cold ground (i.e. dag ground lead) to the anode with a well insulated wire or use a grounding probe.Avoid prolonged exposure at close range to unshielded areas of the picture tube to prevent exposure to x-ray radiation.

The test picture tube used for servicing the chassis at the bench should incorporate safety glass and magnetic shielding. The safety glass provide shielding for the tube viewing area against x ray radiation as well as implosion. The magnetic shield limits the x ray radiation around the bell of the picture tube in addition to the restricting magnetic effects. When using a picture tube test jig for service, ensure that the jig is capable of handling 50kV without causing x ray radiation.

Before returning a serviced receiver to the owner, the service technician must thoroughly test the unit to ensure that is completely safe to operate. Do not use a line isolation transformer when testing.

**Leakage current cold check**

Unplug the A.C. cord and connect a jumper between the two plug prongs.Measure the resistance between the jumpered AC plug and expose metallic parts such as screwheads, antenna terminals, control shafts, etc. If the exposed metallic part has a return path to the chassis, the reading should be between 240kΩ and 5.2MΩ. If the exposed metallic part does not have a return path to the chassis, the reading should be infinite.

**Leakage current hot check**

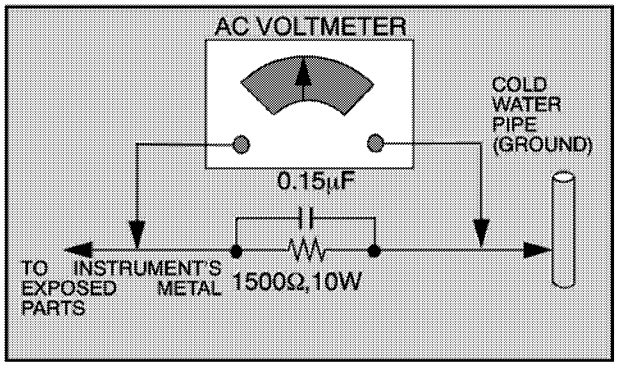
Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during the check.

Connect a 1.5kΩ 10 watt resistor in parallel with a 0.15μF capacitor between an exposed metallic part and ground. Use earth ground, for example a water pipe.

Using a DVM with a 1000 ohms/volt sensitivity or higher, measure the AC potential across the resistor.

Repeat the procedure and measure the voltage present with all other exposed metallic parts.

Verify that any potential does not exceed 0.75 volt RMS. A leakage current tester (such a Simpson model 229, Sencore model PR57 or equivalent) may be used in the above procedure, in which case any current measure must not exceed 0.5 milliamp. If any measurement is out of the specified limits, there is a possibility of a shock hazard and the receiver must be repaired and rechecked before it is returned to the customer.




Hot check circuit

**Insulation test**

Connect an insulation tester between an exposed metallic part and A.C. line. Apply 1080VAC/60Hz for 1 second. Confirm that the current measurement is 0.5mA ~ 2.0mA. Repeat test with other metallic exposed parts.

**X ray radiation**

**WARNING**

The potential source of x-ray radiation in the TV set is in the high voltage section and the picture tube.

**NOTE**

It is important to use an accurate, calibrated high voltage meter.

Set the brightness, picture, sharpness and color controls to minimum.

Measure the high voltage. The high voltage should be 28.4 ± 1.25kV for 20" models and 30.55 ± 1.25kV for 24" models. If the upper limit is out of tolerance, immediate service and correction is required to insure safe operation and to prevent the possibility of premature component failure.

**Horizontal oscillator disable circuit test**

This test must be performed as a final check before the receiver is returned to the customer. See horizontal oscillator disable circuit procedure check in this manual.

# 2 Service notes

**NOTE**

These components are affixed with glue. Be careful not to break or damage any foil under the component or at the pins of the ICs when removing. Usually applying heat to the component for a short time while twisting with tweezers will break the component loose.

**Leadless chip component (surface mount)**

Chip components must be replaced with identical chips due to critical foil track spacing. There are no holes in the board to mount standard transistors or diodes. Some chips capacitor or resistor board solder pads may have holes through the board, however the hole diameter limits standard resistor replacement to 1/8 watt. Standard capacitor may also be limited for the same reason. It is recommended that identical components be used.

Chip resistor have a three digit numerical resistance code, 1st and 2nd significant digits and a multiplier. Example: 162 = 1600 or 1.6kΩ resistor, 0 = 0Ω (jumper).

Chip capacitors generally do not have the value indicated on the capacitor. The color of the component indicates the general range of the capacitance.

Chip transistors are identified by a two letter code. The first letter indicates the type and the second letter, the grade of transistor.

Chip diodes have a two letter identification code as per the code chart and are a dual diode pack with either common anode or common cathode. Check the parts list for correct diode number.

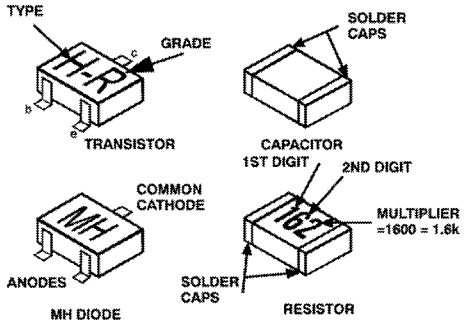
**Component removal**

1. Use solder wick to remove solder from component end caps or terminal.
2. Without pulling up, carefully twist the component with tweezers to break the adhesive.
3. Do not reuse removed leadless or chip components since they are subject to stress fracture during removal.

**Chip component installation**

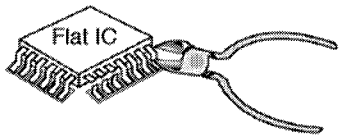
1. Put a small amount of solder on the board soldering pads.
2. Hold the chip component against the soldering pads with tweezers or with a miniature alligator clip and apply heat to the pad area with a 30 watt iron until solder flows. Do not apply heat for more than 3 seconds.

**Chip components**

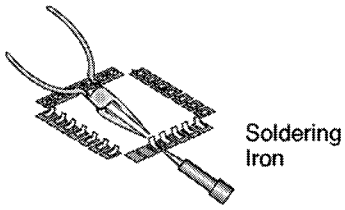



**How to replace flat IC (required tools)**

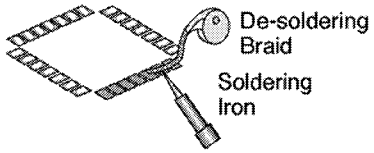
1. Remove the solder from all of the pins of a Flat IC by using a desolder braid



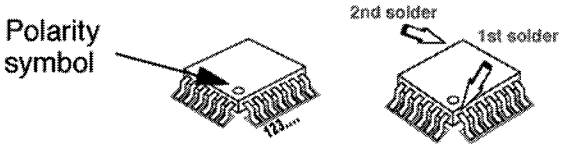

2. Put the iron wire under the pins of the Flat IC and pull it in the direction indicated while heating the pins using a soldering iron. A small awl can be used instead of the iron wire.



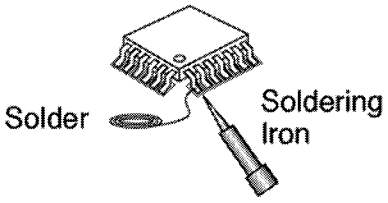

3. Remove the solder from all the pads of the Flat IC by using a de solder braid



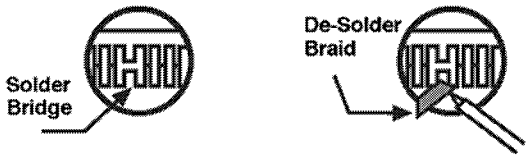

4. Position the new Flat IC in place (apply the pins of the Flat IC to the soldering pads where the pins need to be soldered). Properly determine the positions of the soldering pads and pins by correctly aligning the polarity symbol




5. Solder all pins to the soldering pads using a fine tipped soldering iron




6. Check with a magnifier for solder bridge between the pins or for dry joint between pins and soldering pads. To remove a solder bridge, use a de solder braid as shown in the figure below



**IMPORTANT**

To protect against possible damage to the solid state devices due to arching or static discharge, make certain that all ground wires and CRT DAG wire are securely connected.

**CAUTION**

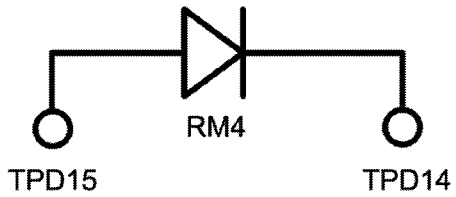
The power supply circuit is above earth ground and the chassis cannot be polarized. Use an isolation transformer when servicing the receiver to avoid damage to the test equipment or to the chassis. Connect the test equipment to the proper ground (hot) or (cold) when servicing, or incorrect voltages will be measured.

## 2.1. X-Ray Protection Circuit Check & Adjustments

This test must be performed as final check before the receiver is returned to the customer. If voltages are out of tolerance, immediate service and correction is required to insure safe operation and to prevent the possibility of premature component failure.

**Equipment:**

1. Isolation transformer.
2. High voltage meter.
3. D.C. Ammeter
4. Short jumper.
5. HHS jig (See figure below).




Diode Connection Jumper.

**Preparation:**

1. Make sure the receiver is turned off.
2. Connect the receiver to an isolation transformer.
3. Connect the ammeter serial from the flyback anode lead to the picture tube anode socket.
4. Prepare short jumper and HHS jig.

**Procedure:**

1. Connect the short jumper between TPD16 & TPD17.
2. Connect the jumper diode between TPD14 and TPD15 (anode connected to TPD15 and cathode to TPD14).
3. Apply 75VAC to AC input of isolation transformer.
4. Turn the receiver on.
5. Apply a monoscope pattern.
6. Set customer picture and brightness controls to the minimum.
7. Set current within 50µA to 100µA by changing the picture and bright controls.
8. Slowly increase AC voltage at the input of the isolation transformer and confirm HHS voltage measure **34.5kV**.
9. Turn power off and remove jigs.

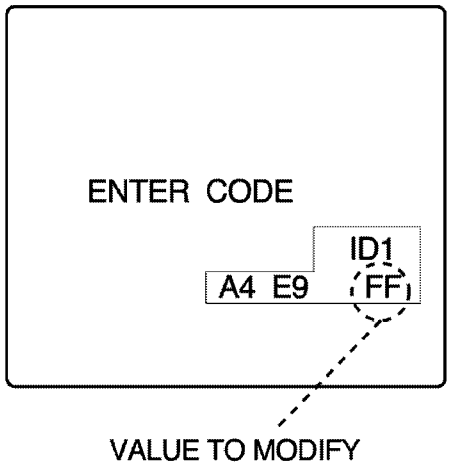
# 3 EEPROM replacement

If a new EEPROM integrated circuit is replaced for servicing, follow the next procedure once that the memory is properly assembled:

1. Enter to service mode.
2. Turn the TV set ON.
3. Once inside service mode the first image that appears on-screen is the ID1 register with the respective address value (FF) like the image below.

**Note:**

All 3 registers (ID1,ID2,ID3) should appear with FF values if a new EEPROM is assembled.




4. With "VOL" keys adjust the correct value according with the service adjustment table (see "Service Mode" section).
5. Change to the next ID switch register with "CH" keys and repeat the same procedure as step 4.
6. When replacing a new EEPROM be sure to set the correct ID switch values for each model.
7. Once that all 3 registers are set with the correct address value, perform all of the remaining adjustments and servicing.

**IMPORTANT:**

Correct ID switch configuration should be input when replacing EEPROM for each television model, otherwise if wrong values are configured, the television software will not function accordingly and properly.

# 4 About lead free solder (PbF)

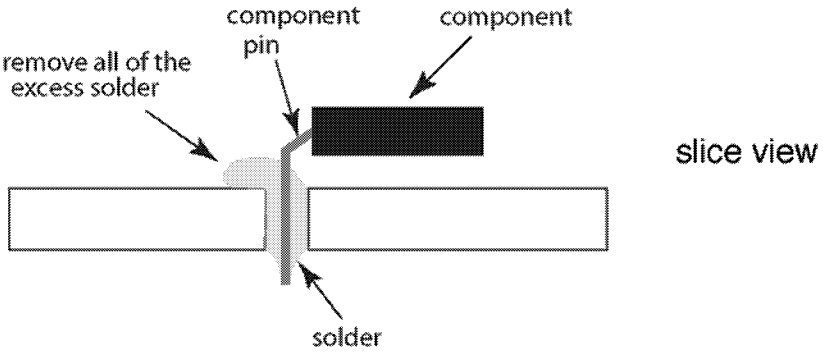
**NOTE**

Lead is listed as (Pb) in the periodic table of elements.
In the information below, Pb will refer to lead solder, and PbF will refer to Lead Free Solder.
The lead free solder used in our manufacturing process and discussed below is (Sn+Ag+Cu).
That is Tin (Sn), Silver (Ag) and Copper (Cu) although other types are available.

This model uses Pb Free solder in it's manufacture due to environmental conservation issues. For service and repair work, we'd suggest the use of Pb free solder as well, although Pb solder may be used.
PCBs manufactured using lead free solder will have the "PbF" or a leaf symbol stamped on the back of PCB.

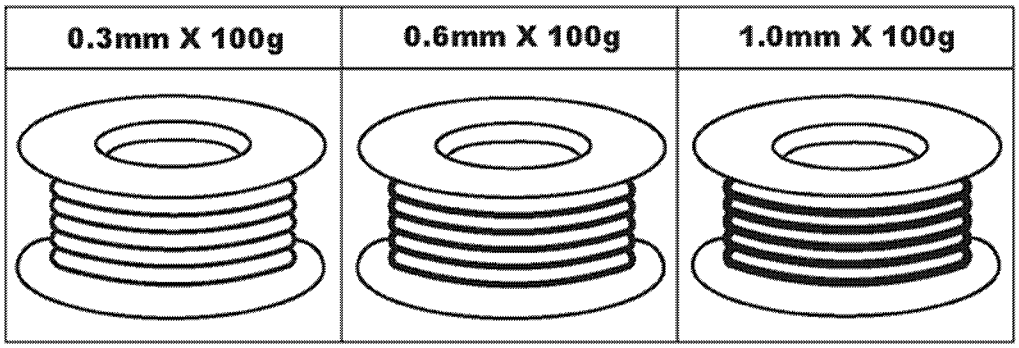
**CAUTION**

- Pb free solder has a higher melting point than standard solder. Typically the melting point is 50 ~ 70 °F (30 ~ 40 °C) higher. Please use a high temperature soldering iron and set it to 700 ± 20 °F (370 ± 10 °C).
- Pb free solder will tend to splash when heated too high (about 1100 °F or 600 °C).
  If you must use Pb solder, please completely remove all of the Pb free solder on the pins or solder area before applying Pb solder. If this is not practical, be sure to heat the Pb free solder until it melts, before applying Pb solder.
- After applying PbF solder to double layered boards, please check the component side for excess solder which may flow onto the opposite side.




**Suggested Pb free solder**

There are several kinds of Pb free solder available for purchase. This product uses Sn+Ag+Cu (tin, silver, copper) solder. However, Sn+Cu (tin, copper), Sn+Zn+Bi (tin, zinc, bismuth) solder can also be used.



# 5 Receiver feature table

| FEATURE/MODEL | CT-20SL13G | CT-24SL13G |
|---|---|---|
| CHASSIS | AP414 | BP401 |
| MICRO | 128K | |
| MENU LANGUAGE | ENG/SPAN/FR | |
| CLOSED CAPTION | X | |
| V-CHIP (USA/CANADA) | X | |
| CHANNEL COUNT | 181 | |
| CHANNEL INFO BANNER | X | |
| VIDEO INPUT SKIP | SKIP | |
| 75 OHM INPUT | X | |
| REMOTE CONTROL | EUR7613Z60 | |
| CRT SUPPLIER | SAMSUNG | MDDM (FLAT) |
| FAMILY | NA10 | |
| COMB FILTER | 3 DIG | |
| HEC/VEC (X=BOTH) | X | |
| VM | --- | X |
| V/A NORM (X=BOTH) | V | |
| COLOR TEMP | X | |
| PRESET/INPUT LABELING | X | |
| VIDEO INPUT PICTURE MEMORY | X | |
| MTS/SAP/DBX | X | |
| BUILT-IN AUDIO POWER | 5Wx2 | |
| No. OF SPEAKERS | 2 | |
| BASS/BAL/TREBLE CONTROL | X | |
| AI SOUND | X | |
| SURROUND | X | |
| SPATIALIZER/BBE | BBE | |
| A/V IN (REAR/FRONT) | 3(2/1) | |
| AUDIO OUT (FAO: F, VAO: V) | F, V | |
| COMPONENT INPUT (Y, Pb, Pr) | 1 | |
| S-VIDEO INPUT (REAR/FRONT) | 1/0 | |
| EPJ/HPJ/MISC | HPJ | |
| DIMENSIONS (WxDxH) | 610.4x500.48x478.16mm<br>24.03x19.70x18.82in | 695.16x464x538.46mm<br>27.36x18.26x21.19in |
| WEIGHT (Kg/Lbs) | 24.5/54.01 | 34/74.95 |

**Note:**

Specifications are subject to change without notice or obligation. Dimensions and weights are approximate.

# 6 Board description table

**CT-20SL13G**

| BOARD | PART NUMBER | DESCRIPTION |
|---|---|---|
| A | TNP2AH047CD | MAIN BOARD |
| C | TNP2AA122CB | CRT BOARD |

**CT-24SL13G / CT-24SL13UG**

| BOARD | PART NUMBER | DESCRIPTION |
|---|---|---|
| A | TNP2AH047DB | MAIN BOARD |
| C | TNP2AA157AH | CRT BOARD |
| Q | TNP2AA152 | PINCUSHION GAIN BOARD |

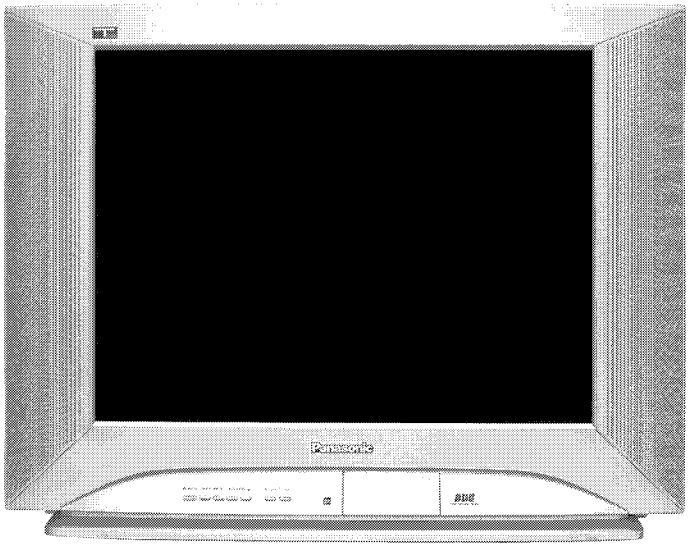
**NOTE**

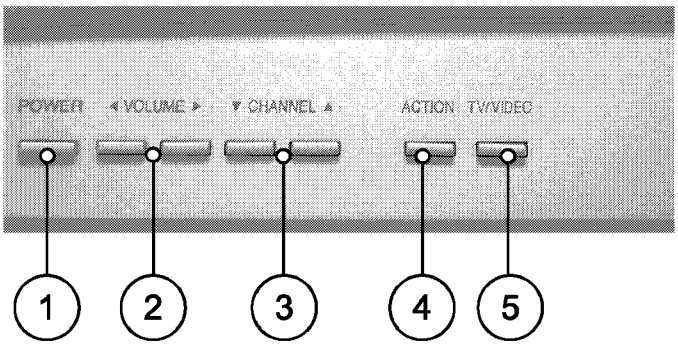
When ordering a replacement board assembly, append an “S” to the board number

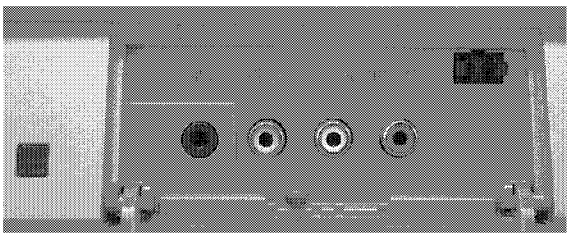
**EXAMPLE**

To order the A Board, for CT-24SL13G the replacement board is TNP2AH047DBS.

# 7 TV Location of controls





IR Sensor
& Front A/V jacks

| Quick reference control operation | |
|---|---|
| 1 | **Power** - Press to turn ON or OFF. |
| 2 | **Volume** - Press to adjust sound level, or to adjust audio menus, video menus, and select operating features when menus are displayed |
| 3 | **Channel** - Press to select programmed channels. Press to highlight desired features when menus are displayed. Also use to select cable converter box channels after programming remote control infra-red codes (the TV/AUX/CABLE switch must be set in CABLE position). |
| 4 | **Action** - Press to display main menu and access on screen feature and adjustment menus. |
| 5 | **TV/Video** - Press to select TV or one of the video inputs. |

# 8 Location of controls (remote)

## 8.1. EUR7613Z60

**POWER**
Press to turn ON and OFF.

**TV - VCR - DBS/CBL - DVD**
Press to select a component.

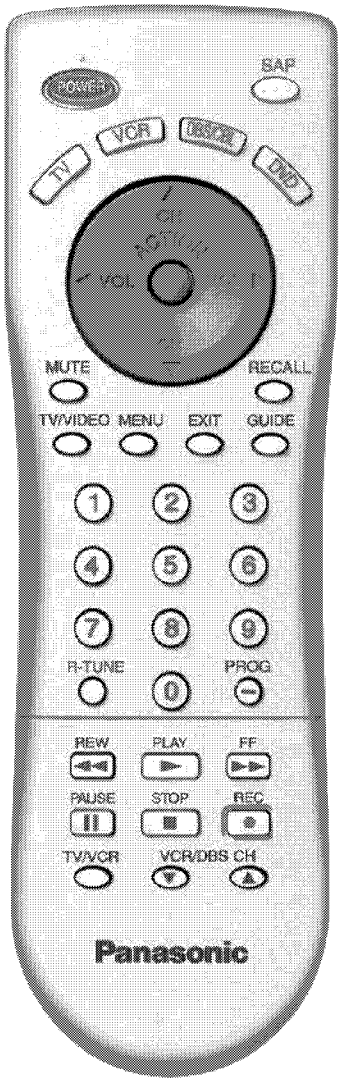
**MUTE**
Press to mute sound.

**TV/VIDEO**
Press to select TV, Video mode.

**MENU**
Press to select TV, Video mode.

**KEYBOARD**
Press to select any channel.

**R-TUNE**
Press to switch to previously viewed channel or video mode.




**SAP**
Press to acces the secondary audio program broadcast.

**CH**
Press to select next or previous channel and navigate in menus.

**VOL**
Press to adjust TV sound and navigate in menus.

**RECALL**
Press to display time, channel sleep timer and other options.

**GUIDE**
DBS and DVD functions button.

**EXIT**
DBS menu function button.

**PROG**
Press for delimiter between major and minor channel number.

**Note:**

For additional information about this remote please refer to the owner's manual section remote operation, listed on the parts list section.

# 9 Dissasembly for service

**Back cover**

Remove all the screws marked with an arrow (←) from the back of the receiver

**NOTE**

Screw configuration, type, and number of screws vary depending on the model of the receiver serviced and the application; various models are covered in this manual. Use same hardware when reassembling the receiver.

- 3 screws at the top edge of the receiver.
- 1 screw by the A/V jacks.
- 1 screw at each lower corner of the receiver.
- 1 screw by the Flyback.

**A-Board - Main chassis**

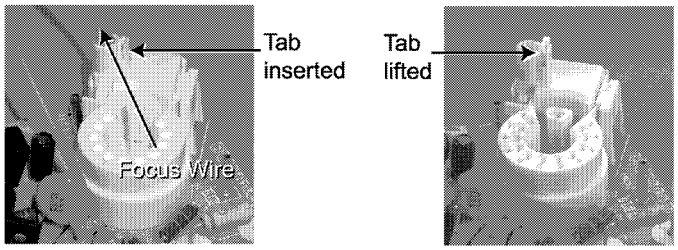
1. Slide the chassis completely out of the guide rails.
2. Stand the receiver on its edge. The underside of the board is completely accessible for component replacement.

**Note:**

Some tie-wraps that secure the wire dressings may need to be unfastened for chassis removal.

**C-Board - CRT output**

The board plugs onto the socket on the CRT neck. To release the Focus wire, use a dull object to release the tab on the socket (near the wire opening) and carefully pull on the wire. To connect the focus wire, press on the tab to lock it then insert the wire in the opening and press on it until it is fully inserted and locked in place. 24" models uses an additional screen wire that plugs into the CRT socket. Use the same procedure of the focus wire. Carefully disconnect C1, C2, C11, C12, C13 and C21 connectors.




Focus cable release

**Q-Board - Pincushion Gain**

Carefully disconnect Q1 connector and remove the board from the 3 fasteners pressing from the sides on each one.

**Speakers**

Each speaker is secured to the cabinet with 4 screws.

**NOTE**

When reassembling speakers be sure to connect the speaker wires to the correct speaker lead (+) (-)

## 9.1. Disassembly for CRT replacement

1. Discharge the CRT as instructed in the "safety precautions".
2. Disconnect the yoke (DY) plug, degaussing coil (DEG) plug from the main board.
3. Unplug the CRT 2nd anode button from the main board.
4. Remove the C-Board from the CRT base and unplug the black wires (CRT dag ground) C11 & C21.
5. Disconnect the speakers plug from the A-Board.
6. Lift the main chassis (A-Board) and all mounted boards completely out with the CRT board attached.
7. Perform complete removal of chassis, as instructed in "disassembly for service" section.

**CRT replacement**

1. Perform "disassembly for CRT replacement" procedure.
2. Insure that the CRT H.V. Anode button is discharged before handling the CRT. Read the "safety precautions" section on handling the picture tube.
3. Remove the components from the CRT neck and place the cabinet face down on a soft pad.
4. Note the original order for the CRT mounting hardware as they are remove from the CRT mounting brackets at each corner of the CRT.
5. Remove the CRT with the degaussing coil and the dag ground braid attached.
6. Note the original locations and mounting of the degaussing coil and the dag ground assembly to insure proper reinstallation on the replacement CRT.

   **To remove and remount the degaussing coil:**

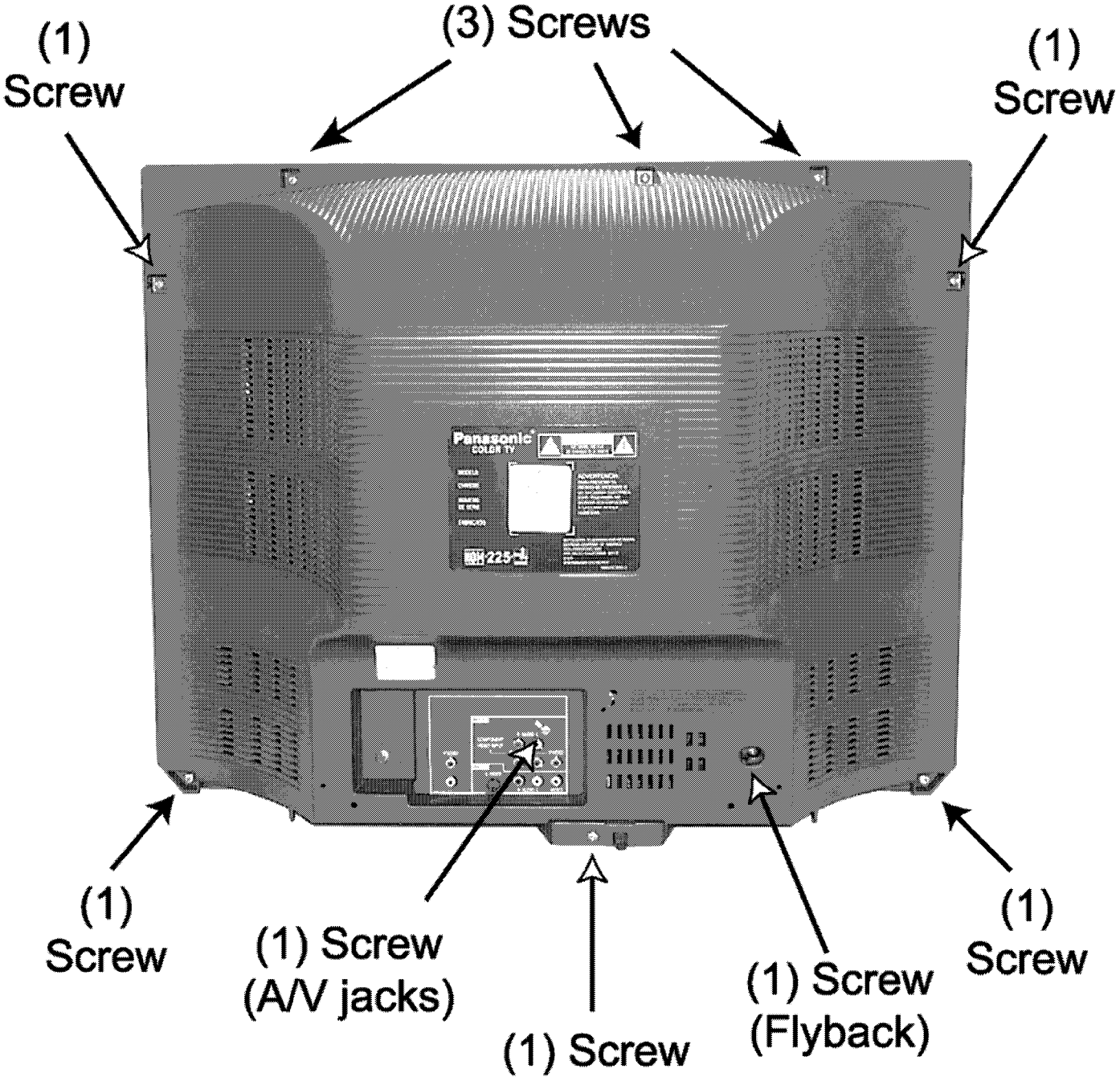
   - Unhook the coil spring from the bottom corners of the CRT ears.
   - Release the braid loop from the upper corners of the CRT ears.
7. Mount the dag ground braid on the replacement CRT. Position the degaussing coil with new ties.

   Dress coil as was on the original CRT.
8. Replace the components on CRT neck and reinstall into cabinet. Verify that all ground wires and circuit board plugs get connected.

   **IMPORTANT NOTICE**

   When ordering the CRT, please order CRT and CRT kit also. Please see parts list section for part numbers.

## 9.2. Back cover removal

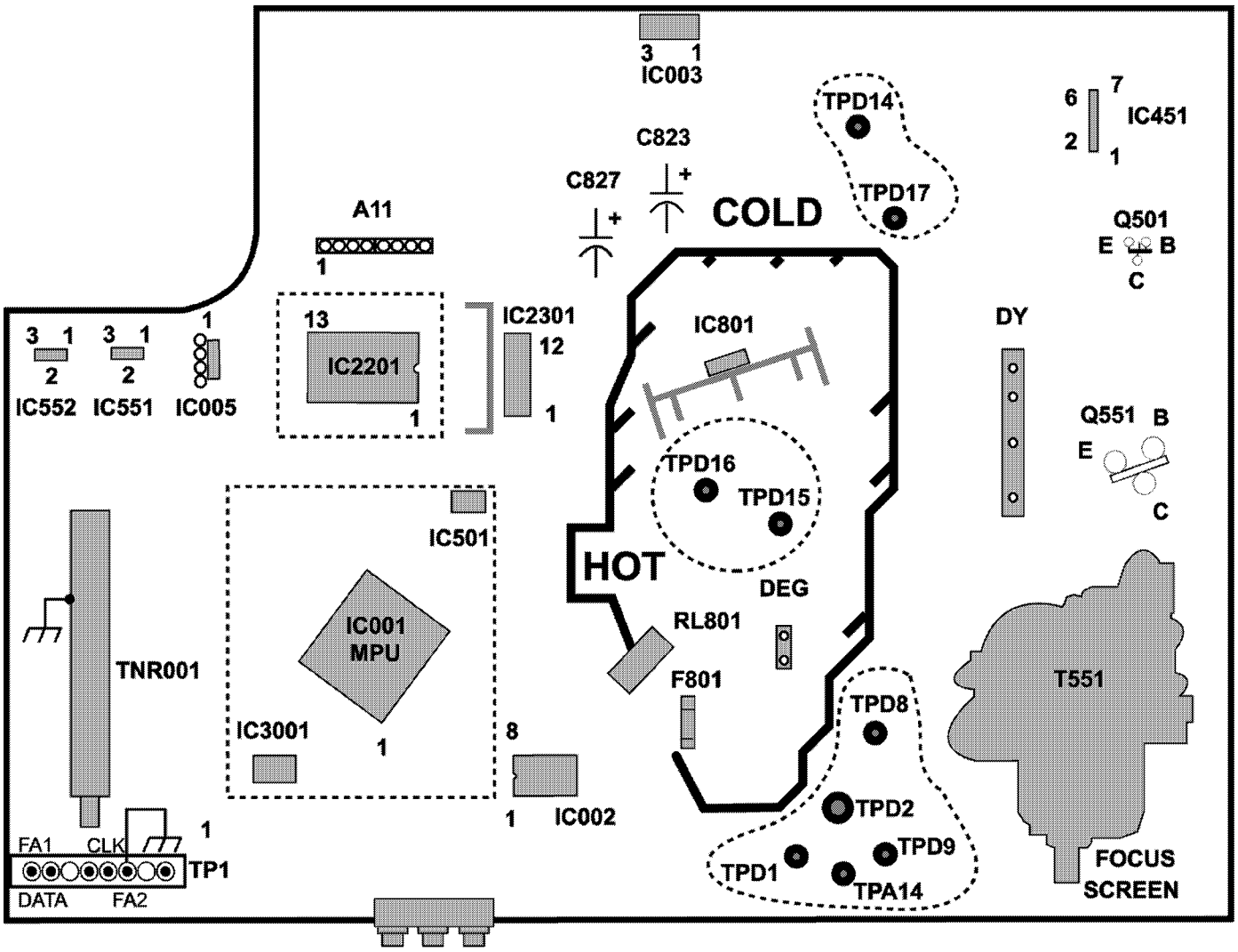


# 10 Chassis service adjustment procedures

All service adjustments are factory preset and should not require adjustment unless controls and/or associated components are replaced.

**Note:**

Connect the (-) lead of the voltmeter to the appropriate ground. Use IC801's heat sink when the HOT ground symbol is used. Otherwise, use COLD ground (tuner shield, IC451's heat sink or FA2).




Component and voltage test points

**Note:**

Components and test points within doted areas are located on trace side.

**B+ voltage check**

1. Set the BRIGHT and PICTURE to minimum by using the PICTURE menu.
2. Connect the DVM between C825 (+ side) or TPD14 and cold ground.
3. Confirm that B+ voltage is 131.0V ± 2.0V. This voltage supplies B+ to the horizontal output and flyback circuits.

**Source voltage chart**

120V AC line input. Set the BRIGHT and the PICTURE to minimum by using the PICTURE menu. Use cold or hot ground for the (-) lead of the DVM as needed.

| A-BOARD | TEST POINT | VOLTAGE | |
|---|---|---|---|
| | | SAMSUNG CRT | MDDM CRT |
| +B2 | TPD14 | 131.0 ± 2.0V | 131.0 ± 2.0V |
| SOUND | C823 (+) | 22.7 ± 1.0V | 22.7 ± 1.0V |

| A-BOARD | TEST POINT | VOLTAGE | |
|---|---|---|---|
| | | SAMSUNG CRT | MDDM CRT |
| STB12V | C827 (+) | 12.7 ± 1.0 V | 12.8 ± 1.0 V |
| 220V | TPA14 | 210 ± 10 V | 205 ± 10 V |
| VERTICAL | TPD8 | 23.7 ± 1.5V | 27.4 ± 1.5V |
| 9V | IC551 pin 3 | 9.0 ± 0.5V | 9.0 ± 0.5V |
| 5V | IC552 pin 3 | 5.0 ± 0.5V | 5.0 ± 0.5V |
| 3.3V | IC005 pin 2 | 3.3 ± 0.3V | 3.3 ± 0.3V |
| EHT | CRT anode | 28.4 ± 1.25kV | 30.55 ± 1.25kV |
| HEATER | JK351 H-HGND | 6.2 ± 0.24V | 6.3 ± 0.24V |

**High voltage check**

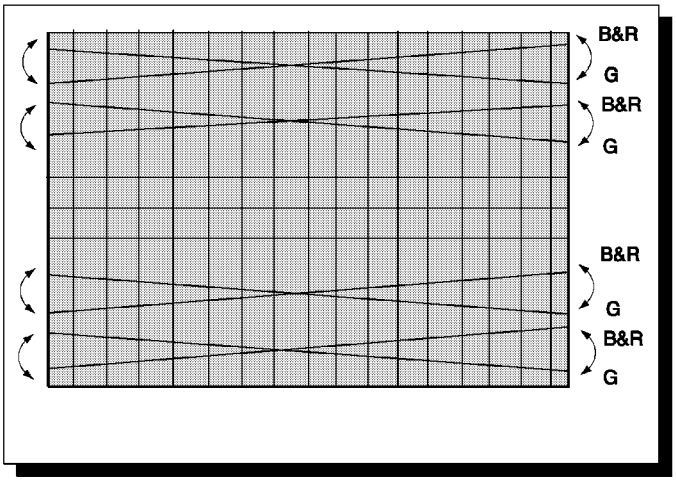
1. Select an active TV channel and confirm that horizontal is in sync.
2. Adjust BRIGHTNESS and CONTRAST using PICTURE icon menu so video just disappears.
3. Using a high voltage meter confirm that the high voltage is 28.4 ± 1.25kV for 20" models and 30.55 ± 1.25kV for 24" models.

# 11 Service mode (mechanical controls)

## 11.1. Dynamic convergence adjustment (for 24" models only)

**YV Adjustment**
**(VR1 for Horizontal dynamic convergence)**

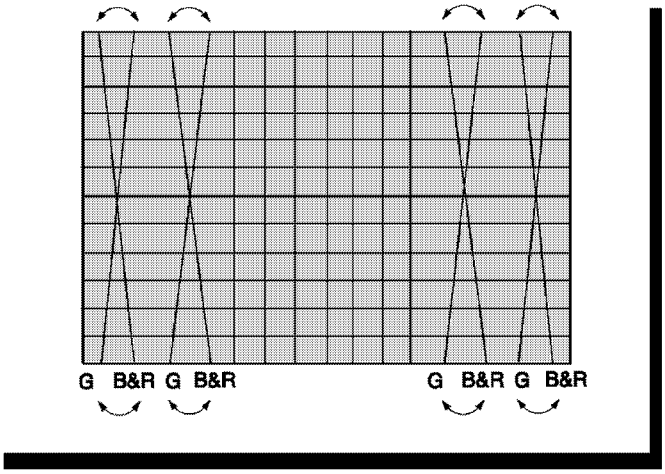
1. Apply a crosshatch pattern.
2. Adjust contrast and brightness customer controls to obtain a correct picture.
3. With a driver Adjust VR1 (located in deflection yoke board to obtain a proper convergence at top and bottom of the screen.




VR1 Adjustment ($Y_V$)

**YH Adjustment**
**(VR2 for vertical dynamic convergence)**

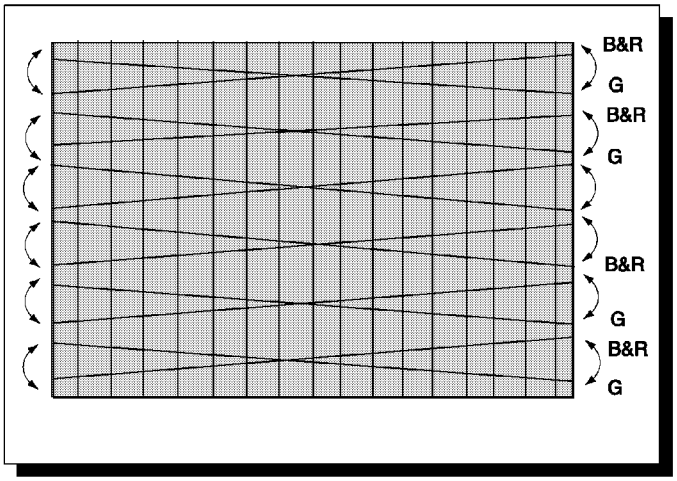
1. Apply a crosshatch pattern.
2. Adjust contrast and brightness customer controls to obtain a correct picture.
3. With a driver Adjust VR2 (located in deflection yoke board to obtain a proper convergence at left and right side of the screen.




VR2 Adjustment ($Y_H$)

**XV Adjustment**
**(precise adjustment)**

1. Apply a crosshatch pattern.
2. Adjust contrast and brightness customer controls to obtain a correct picture.
3. With a driver adjust the coil located in deflection yoke board to obtain a proper horizontal convergence .




Xv adjustment

# 12 Service mode (electronic adjustments)

This receiver has electronic technology using the $I^2C$ bus concept. It performs as a control function and it replaces many mechanical controls. Instead of adjusting mechanical controls individually, many of the control functions are now performed by using "on screen display menu". (The service adjustment mode).

**NOTE**

It is suggested that the technician reads all the way through and understand the following procedure for entering/exiting the service adjustment mode; then proceed with the instructions working with the receiver. When becoming familiar with the procedure, the flow chart for service mode may be used as a quick guide.

**Quick entry to service mode**

When minor adjustments need to be done to the electronic controls, the method of entering the service mode without removal of the cabinet back is as follows using the remote control:

1. Select SET-UP icon and select CABLE mode.
2. Select TIMER icon and set SLEEP time for 30 Min.
3. Press "ACTION" twice to exit menus.
4. Tune to the channel 124.
5. Adjust VOLUME to minimum (0).
6. Press VOL → (decrease) on receiver. Red "CHK" appears in upper corner.

   **To toggle between aging and service modes:**

   While the "CHK" is displayed on the left top corner of the CRT, pressing "ACTION" and "VOL" UP on the TV simultaneously will toggle between the modes. Red "CHK" for service and yellow "CHK" for aging.
7. Press POWER on the remote control to display the service adjustment modes menu, select adjustment by pressing the volume right/left buttons and channel up/down buttons on the remote and ACTION to enter the adjustment.

| | | | | |
|---|---|---|---|---|
| **MTS** | MTSIN | SEPAL | SEPAH | |
| **CLOCK** | CLOCK | | | HHSTH |
| **VIDEO** | COLOR | TINT | BRIGH | CONT |
| | B-Y_G | CUT_G | CUT_R | CUT_B |
| | BRT | R-DR | B-DR | |
| **HDEF** | H-POS | H-WID | PCC | |
| | TOPG | BTMG | TRAP | |
| **FINE** | PCCHG | PCCLG | PCCHS | PCCLS |
| | TOPSL | BTMSL | | |
| **VDEF** | VEAMP | V-C | V-S | VPOS |
| **SETID** | ID1 | ID2 | ID3 | |

**Exiting the service mode:**

This TV goes out from service mode when it is unplugged or turned OFF. To exit the service mode, turn the TV OFF from or unplug the TV from A.C.

**Other method**

Press ACTION and POWER on the receiver simultaneously for at least 2 seconds.

The receiver momentarily shuts off; then comes back on tuned to channel 3 with a preset level of sound.

Any programmed channels, channels caption data and some others user defined settings will be erased when exited by pressing ACTION and POWER on receiver.

**IMPORTANT NOTE**

Always check that the TV exits the service mode.

**To confirm colors**

When in service mode (red "CHK" is displayed) press RECALL on the remote control to enter the purity field check mode

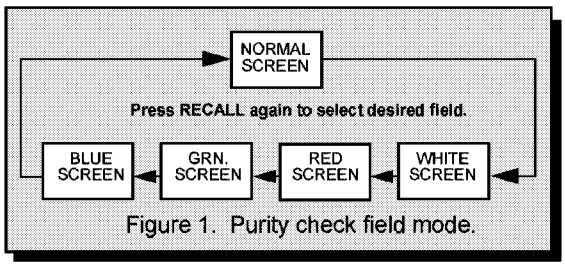


Figure 1. Purity check field mode.

**Entering service mode (open-back method)**

While the receiver is connected and operating in normal mode, momentarily short test point FA1 (TP1 pin 2) to cold ground (TP1 pin 3).

**The receiver enters the aging mode.**

Yellow letters "CHK" appear in the upper left corner of the screen.

(The volume right/left and channel up/down will adjust rapidly).

**Note:**

If service mode is accessed by this method be sure to reset the set after service is performed.

# 12.1. Service adjustment default values for items

| NAME | DESCRIPTION | REGISTER VALUE | |
|---|---|---|---|
| | | CT-20SL13G | CT-24SL13G/UG |
| MTSIN | MTS INPUT LEVEL | 22 | |
| SEPAL | MTS LOW LEVEL SEPARATION | 0B | |
| SEPAH | MTS HIGH LEVEL SEPARATION | 1C | |
| CLOCK | CLOCK | 128 | |
| HHSTH | HHS VOLTAGE LEVEL REFERENCE | 9A | |
| COLOR | COLOR | 15 | |
| TINT | TINT | 56 | |
| BRIGH | SUB-BRIGHTNESS | 54 | |
| CONT | SUB-CONTRAST | 70 | |
| B-Y_G | MAGENTA TINT ADJ | 80 | |
| CUT_G | GREEN CUT-OFF | 4F | |
| CUT_R | RED CUT-OFF | EC | |
| CUT_B | BLUE CUT-OFF | 34 | |
| BRT | BRIGHT | 54 | |
| R-DR | RED DRIVE | 66 | |
| B-DR | BLUE DRIVE | CD | |
| H-POS | HORIZONTAL POSITION | 82 | |
| H-WID | HORIZONTAL WIDTH | 57 | |
| PCC | PINCUSHION | 35 | |
| TOPG | TOP CORNER PINCUSHION | BA | |
| BTMG | BOTTOM CORNER PINCUSHION | B6 | |
| TRAP | TRAPEZOID | 84 | |
| PCCHG | PINCUSHION HIGH | 00 | |
| PCCLG | PINCUSHION LOW | 02 | |
| PCCHS | PINCUSHION HIGH | 00 | |
| PCCLS | PINCUSHION LOW | 00 | |
| TOPSL | TOP CORNER PINCUSHION SLICE LEVEL | 03 | |
| BTMSL | BOTTOM CORNER PINCUSHION SLICE LEVEL | 00 | |
| VEAMP | VERTICAL SIZE | 7E | |
| V-C | VERTICAL LINEARITY | 4F | |
| V-S | VERTICAL SIZE CORRECTION | 1E | |
| VPOS | VERTICAL POSITION | 81 | |
| ID1* | ID SWITCH 1 | F8 | FC |
| ID2* | ID SWITCH 2 | 1F | 5F |
| ID3* | ID SWITCH 3 | 7B | 7B |

**IMPORTANT:**

These table values are approximated and could change due to variation of electrical characteristics in each set, except for the ID switch values.

***Note:**

The correspondent ID switch (ID1, ID2, ID3) data configuration should not be modified in any way. If EEPROM circuit needs to be replaced, these ID values should be configured according with this table.

# 13 Service adjustments (electronic controls)

**NOTE**

Please correlate with available pattern on all adjustments

## 13.1. Sub-Brightness and Contrast Service DAC adjustment (BRIGH, CONT)

Adjustment of this control is important for setting proper operation of customer brightness and picture controls. Do not adjust the SCREEN VR after the sub-brightness is set.

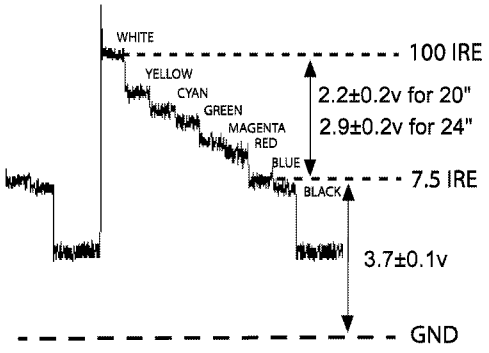
This adjustment is factory set. Do not adjust unless repairs are made to associated circuit, the CRT Board or when the CRT is replaced.

**Preparation**

1. Apply a colorbar pattern.
2. Set the PICTURE control to the maximum.
3. Set COLOR control to minimum (no color on picture).
4. Set the BRIGHTNESS control to the center.
5. Set the SHARPNESS control to the center.
6. Connect the oscilloscope to TP35 (or TP47G).

**Procedure**

1. In the service mode, select DAC for brightness adjustment "BRIGH", and adjust data to obtain 3.7±0.1V between 7.5 IRE and GND level at TP35 (TP47G). (See waveform detail).
2. In service mode, select DAC for contrast adjustment "CONT", and adjust data to obtain 2.2±0.1V (for 20" CRT) or 2.9±0.1V (for 24" CRT) between 7.5IRE and 100IRE level at TP35 (TP47G). (See waveform detail).




## 13.2. Color output adjustment Service DAC adjustment (COLOR, TINT)

**NOTE**

if a rainbow pattern generator is available perform the following procedure; the next section describes the procedure with no rainbow pattern.

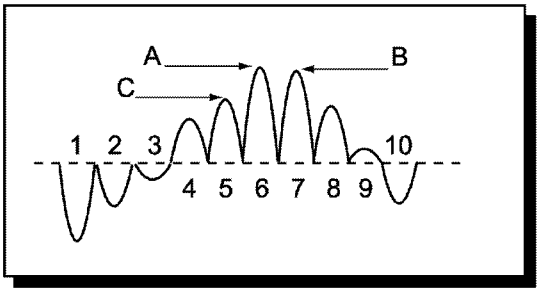
Make sure that sub-contrast adjustment was finished prior to perform this adjustment.

**PREPARATION**

1. Normalize the picture settings.
2. Set the BRIGHTNESS control to minimum.
3. Set the COLOR control to the center.
4. Set the TINT control to the center.
5. Set the PICTURE control to the maximum.
6. Set the SHARPNESS control to the minimum.

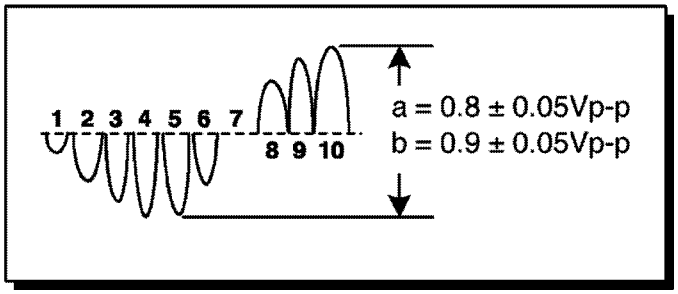
**PROCEDURE**

1. Apply a rainbow color bar pattern.
2. Connect the oscilloscope to TP37 (or TP47B).
3. In service mode adjust "TINT" register until the waveform measured is as the one shown. Tint level from A and B peaks must be almost in the same level (0.35 Vp).




TP37 Waveform (TP47B).

4. Connect the oscilloscope to TP35 and GND.
5. Adjust "COLOR" register so that the amplitude is 0.8 ± 0.05Vp-p for 20" CRT and 0.9 ± 0.05Vp-p for 24" CRT (see figure below).




TP35 Waveform (TP47G).

## 13.3. Color output adjustment Service DAC adjustment (COLOR, TINT, B-Y_G)

**NOTE**

Color and tint adjustment sets the reference settings for the user controls; It is important to read the procedures.

**(NO RAINBOW PATTERN)**

Make sure that sub-contrast adjustment was finished prior to perform this adjustment

**PREPARATION**

Normalize the picture settings.

**PROCEDURE**

1. Apply a color bar pattern.
2. In service mode adjust "R DR" and "B DR" data to "80".
3. In service mode adjust "TINT" data so that the color

does not become greenish or redish.

4. In service mode adjust "COLOR" data so that the color level is not too high (saturated) or too low (tending to black and white).
5. In service mode adjust "B-Y G" data so that blue and green seem natural.
6. Confirm that saturation and picture are normal (normal image).
7. If image is not satisfactory, repeat adjustment until the image is normal and natural.

**NOTE**

The image can be compared against other set to see the image quality.

## 13.4. Color temperature adjustment (B/W Tracking) Service DAC Adjust. (CUT R) (CUT G) (CUT B) (R DR) (B DR)

**Minor Touch-Up Method**

OBSERVE low and high brightness areas of a B/W picture for proper tracking. Adjust only as required for "good gray scale and warm highlights".

1. LOW LIGHT areas - In service mode for making electronic adjustments, select CUT R, CUT G, CUT B and adjust the picture for gray.
2. HIGH LIGHT areas - In service mode for making electronic adjustments, select drive R DR, B DR and adjust the picture for warm whites.

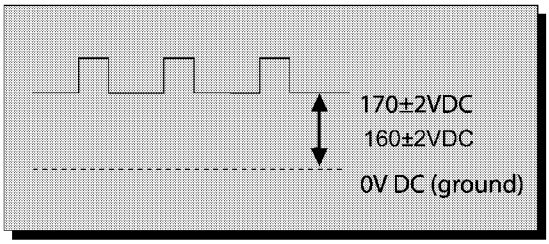
**Complete adjustment**

**PREPARATION**

1. Turn the receiver "ON" and allow 30 minutes warm up at WHITE PATTERN.
2. Apply a color bar pattern (with no color).
3. Turn the SCREEN control (part of FBT T551) fully counterclockwise.
4. Preset the following service DACs for best results:
   - BRIGH_____1 D0
   - CUT R_____02 00
   - CUT G_____02 00
   - CUT B_____02 00
   - R DR_____07 FF
   - B DR_____07 FF

**PROCEDURE**

1. Connect the oscilloscope to KG (CRT-Board).
2. In service mode for making electronic adjustment, select "BRIGH" DAC.
3. Press RECALL button on the remote control to collapse the raster. (service SW).
4. Connect oscilloscope to KG on C-Board and adjust service mode "CUT-G" DAC until 160 ± 2V(for 20" CRT) or 170±2V (for 24" CRT) above DC ground is measured.
5. Remove the probe from KG.
6. Turn screen clockwise slowly until color is slightly appeared.
7. Then adjust "CUT R" and "CUT B" until line becomes white.
8. Press RECALL button on the remote to restore the raster.
9. Adjust "R DR" and "B DR" so the white seems like white and black like black.
10. Apply a normal signal and confirm that the image is normal and a good gray scale.
11. If correction is needed perform minor touch-up method.




## 13.5. Deflection adjustments

**To reset deflection adjustments**

To reset deflection adjustments to factory adjusted default, enter to service mode (with red CHK displayed), press POWER button on remote to display the service menu, then press and hold RECALL button for at least three seconds, a reset message will appear in the image.

Use this feature when deflection adjustment gets off adjustment to the point that it cannot be adjusted back easily.

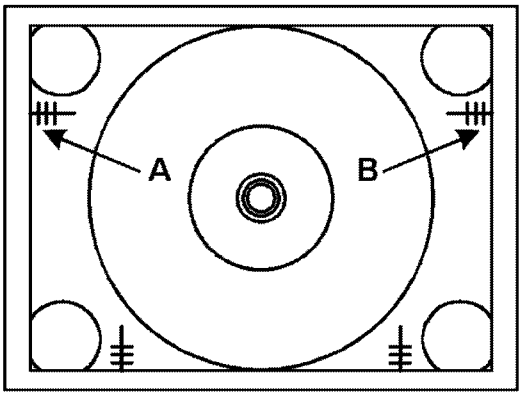
### 13.5.1. H-Center adjustment

**PREPARATION**

1. Apply a crosshatch pattern.
2. Normalize the picture settings.

**PROCEDURE**

1. Apply a monoscope pattern to center the picture.




Horizontal Center Adjustment

2. If the horizontal center is not aligned, in service mode adjust "H POS" DATA to adjust the horizontal center of the monoscope pattern to the CRT center.
3. Verify that horizontal width (A & B mark) is within 4.5 ± 0.7.

## 13.5.2. Horizontal width adjustment (H-WID)

**PREPARATION**

Apply a pattern that permits the centering of the image.

**Procedure:**

1. Adjust "VRAS" data so that the picture is in the center and lines are straight (check mark on CRT sides).
2. Apply a crosshatch pattern.
3. Adjust "PCC" data to make lines straight.
4. Adjust "H-WID" data to correct vertical size of the image.
5. Adjust "VEAMP" data to correct vertical size of the image.

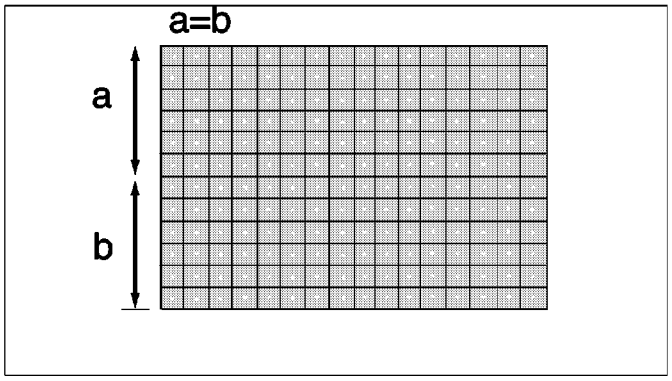
## 13.5.3. Vertical linearity(V-C), V-Size and V-Position adjustment

**PREPARATION**

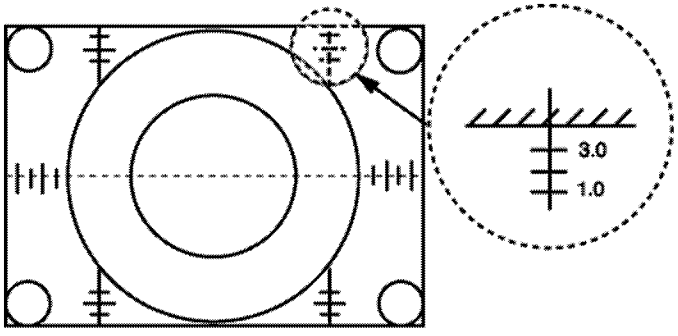
1. Apply a crosshatch pattern
2. Normalize the picture settings.

**PROCEDURE**

1. Enter service mode, select DAC adjustment "V-POS" and adjust monoscope pattern to the center vertical position of the CRT center mark.
2. Adjust linearity data "V-C" so that interval of "a" is same as "b" (a=b).




3. If the v-position is not at the CRT center, adjust V position "V POS" DATA again.
4. Apply a monoscope pattern.
5. Confirm that center horizontal line is in center mark on CRT.
6. Adjust "VEAMP" register for correct vertical size by making monoscope round circle leaving 4 marks off the CRT edge.




Vertical centering adjustment.

## 13.5.4. V-S Correction adjustment

**PREPARATION**

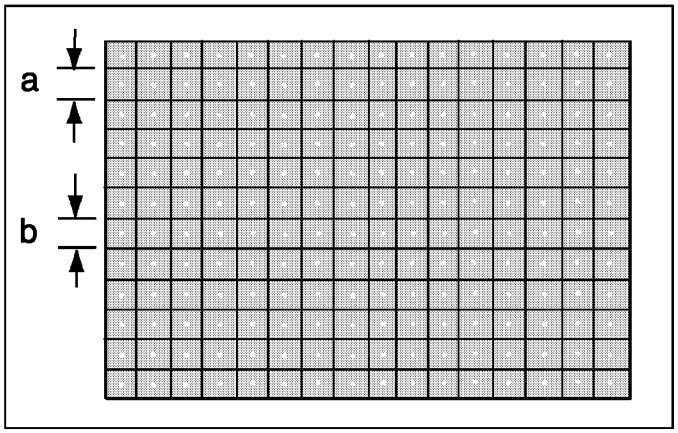
1. Apply a crosshatch pattern
2. Normalize the picture settings.

**PROCEDURE**

1. Enter to service mode
2. Check a and b sizes, If b-a < -1.5mm (in top & bottom extending case)
   - Increase "V-S" DATA by one step

   **NOTE**

   Repeat "a" and "b" until b-a ± 1.5mm
3. Confirm to make outermost circle of monoscope pattern a correct circle




V-Adjustment

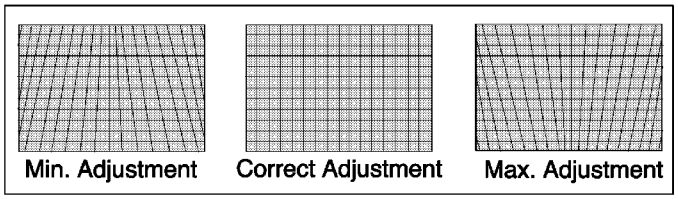
## 13.5.5. Trapezoid adjustment (TRAP)

**PREPARATION**

1. Apply a crosshatch pattern.
2. Normalize the picture icon video adjustments.

**Procedure:**

1. Enter service mode, select "TRAP" and adjust DATA so that lines at right and left are vertical like a solid line.




## 13.5.6. PCC adjustment (PCC)

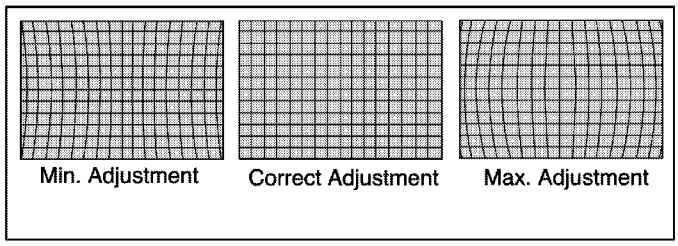
This adjustment helps to correct left and right curved sides of picture.

**PREPARATION**

1. Apply a crosshatch pattern.
2. Normalize the picture icon video adjustments.

**Procedure:**

1. Adjust "PCC" data so that the first and third line make a good balance (see figure below).




PCC Adjustment

### 13.5.7. Corner PCC adjustment (TOPG, TOPSL, BTMG, BTMSL)

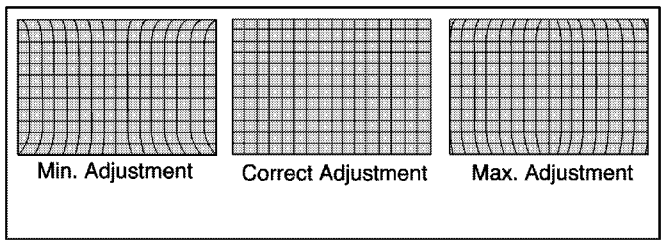
This controls help to adjust top and bottom sides of picture.

**PREPARATION**

1. Apply a crosshatch pattern.
2. Normalize the picture icon video adjustments.

**Procedure:**

1. Adjust "TOPG" and "TOPSL" data to correct upper side of the image linearity.
2. Adjust "BTMG" and "BTMSL" data to correct lower side of the image (see figure below).




Top and bottom adjustment

## 13.6. MTS circuit adjustments

**The MTS circuit adjustments require two steps:**

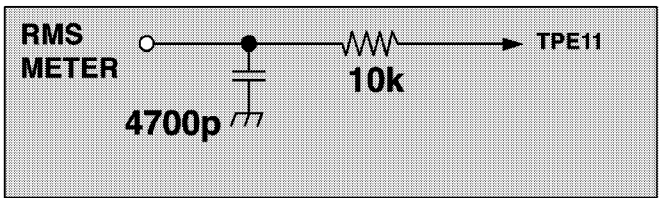
1. Input level adjustment.
2. Stereo separation adjustment.

**Input level adjustment**

**Service DAC adjustment (MTSIN)**

**PREPARATION**

1. Connect an RMS meter with filter jig as shown in figure to TPE11.




Filter Jig

2. Connect an RF signal generator to the RF antenna input.

**PROCEDURE**

1. Apply the following signal from the RF signal generator:
   - Video: 100 IRE flat field, 30% modulation.
   - Audio: 300Hz, 100% modulation, monaural (70 ±5dB, 75Ω OPEN, P/S 10dB). Make sure that the 75μs pre-emphasis is OFF.
2. Adjust the MTS input level adjustment "MTSIN" data until the RMS voltage measured is 120 ± 4.0mVrms.

**Stereo separation adjustment (SEPAH)**

**PREPARATION**

1. Connect an R.F. signal generator to the RF antenna input.
2. Connect a scope to TPE10.

**PROCEDURE**

1. Select stereo mode in audio menu
2. Apply the following signal from the RF signal generator:
   - Video: 100 IRE flat field, 30% modulation.
   - Audio: 300Hz, 30% modulation, stereo (left only) (70±5dB, 75Ω OPEN, P/S 10dB).

   **NOTE**

   After setting 30% modulation with P.L. SW and N.R. SW OFF, turn P.L. SW and N.R. SW ON.
3. In service mode, adjust the MTS Low-Level separation adjustment "SEPAL" data until the amplitude displayed on the scope is minimum.
4. Apply the following signal from the RF signal generator:
   - Video: 100 IRE flat field, 30% modulation
   - Audio: 3KHz, 30% modulation, stereo (left only) (70 ±5dB, 75Ω OPEN, P/S 10dB).

   **NOTE**

   After setting 30% modulation with P.L. SW and N.R. SW OFF, turn P.L. SW and N.R. SW ON.
5. Adjust the MTS High-level separation adjustment "SEPAH" until the amplitude displayed on the scope is minimum.
6. Repeat above steps 2 through 5 until the amplitude is at minimum for both signals.

## 13.7. Clock adjustment (CLOCK)

**PREPARATION**

Connect the frequency counter from TP017 (IC001 pin 79) to cold ground

**PROCEDURE**

1. Turn the receiver "OFF" with the A.C. power applied.
2. Measure TP017 (IC001 pin 79) for the frequency of the waveform and record the reading.

   **NOTE**
3. TP017 (IC001 pin 79) measurement must have at least four digits of resolution following the decimal point. Example: 000.0000
4. Place the receiver into service mode for making electronic adjustment, select the clock adjustment DAC "CLOCK".
5. Calculate and set "CLOCK" based on the following formula:

$$CLOCK = 128 - \left[\frac{(TP017_{freq} - 610.35)}{610.35} \times 450000\right]$$

**NOTE**

TP017 (IC001 pin 79) measurement will not change regardless of the value stored in CLOCK.

# 13.8. Service Adjustments Mechanical Controls

**WIDTH CORRECTION ADJUSTMENT**

**Note**

Perform this adjustment only when FBT is changed.

**FOCUS (PART OF T551)**

**Preparation**

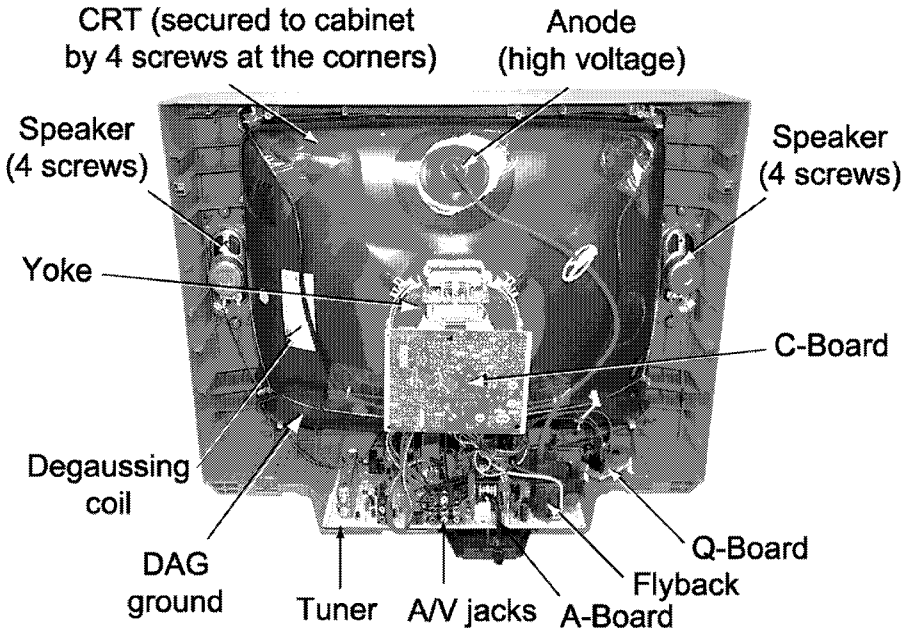
Apply a crosshatch pattern with dots.

**Procedure**

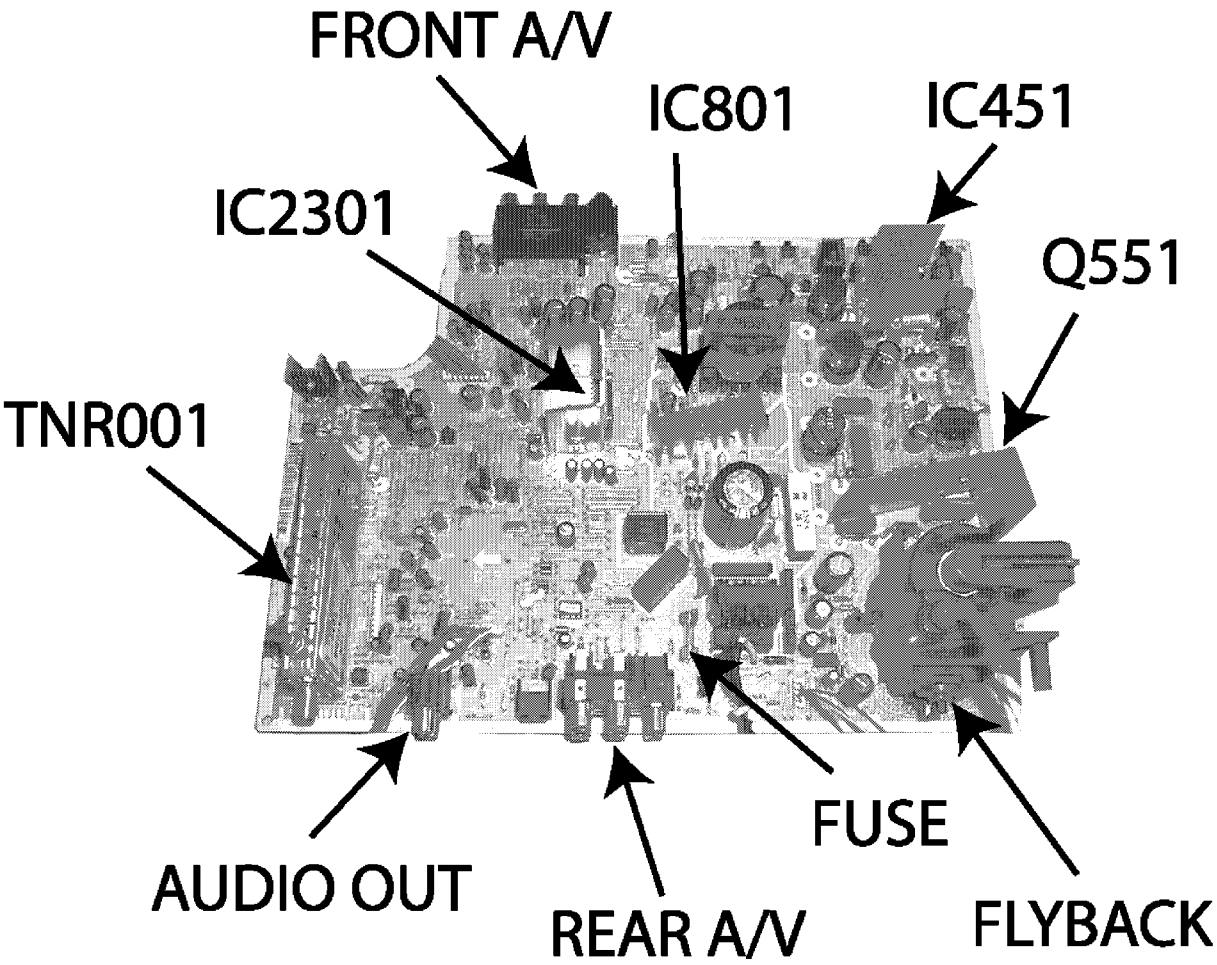
1. Adjust the FOCUS VR to obtain the sharpest and clearest dot pattern.
   - Adjust for best center.
   - Adjust for best area between the center and top right corner.

# 14 Identification of components

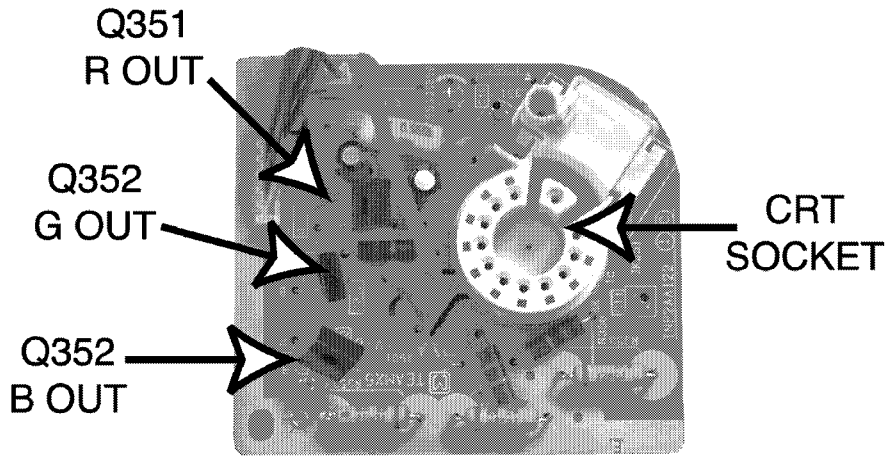
## 14.1. Chassis Components



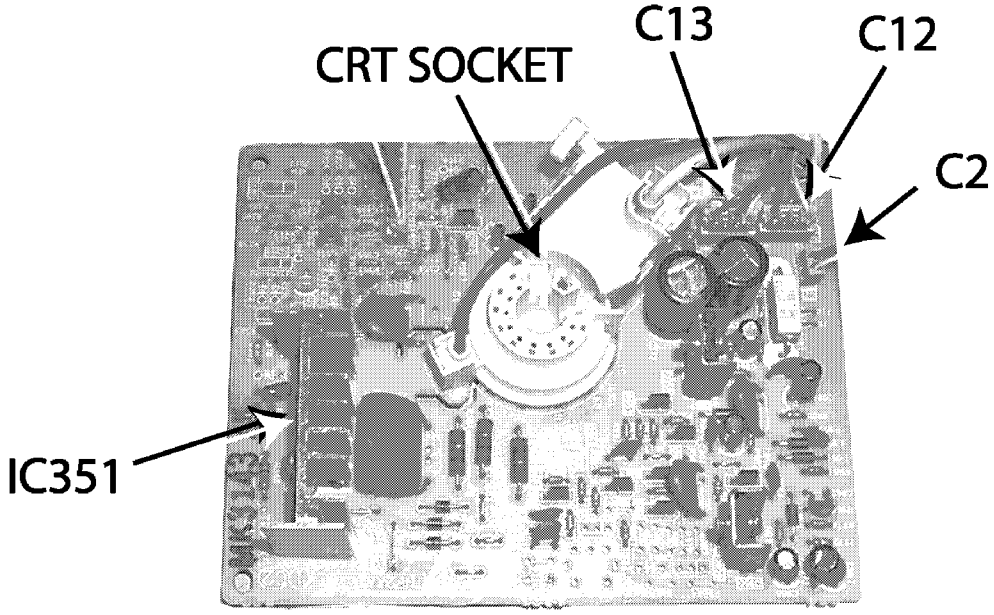

## 14.2. A-Board Chassis



## 14.3. C-Board Chassis

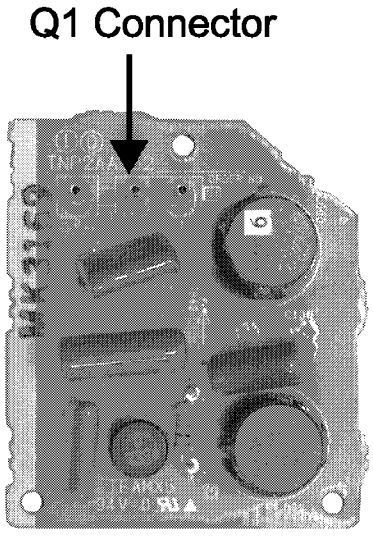



## 14.4. C-Board Chassis (24" models)

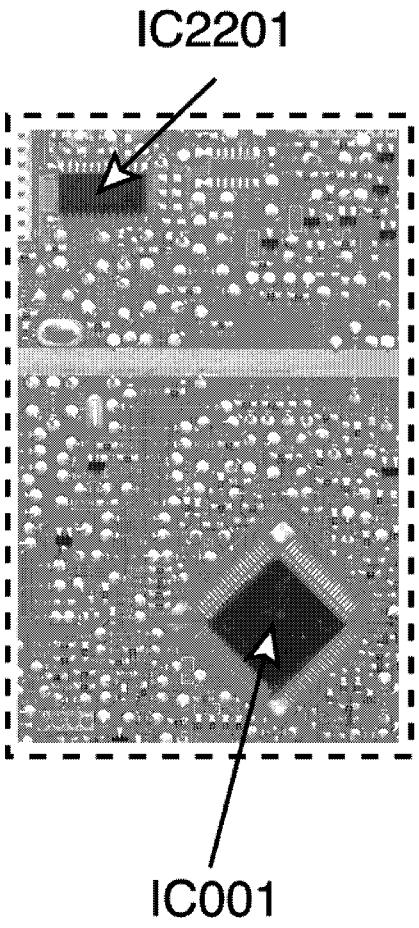



C-Board main components

## 14.5. Q-Board Chassis (24" models)



## 14.6. A-Board surface-mounted components



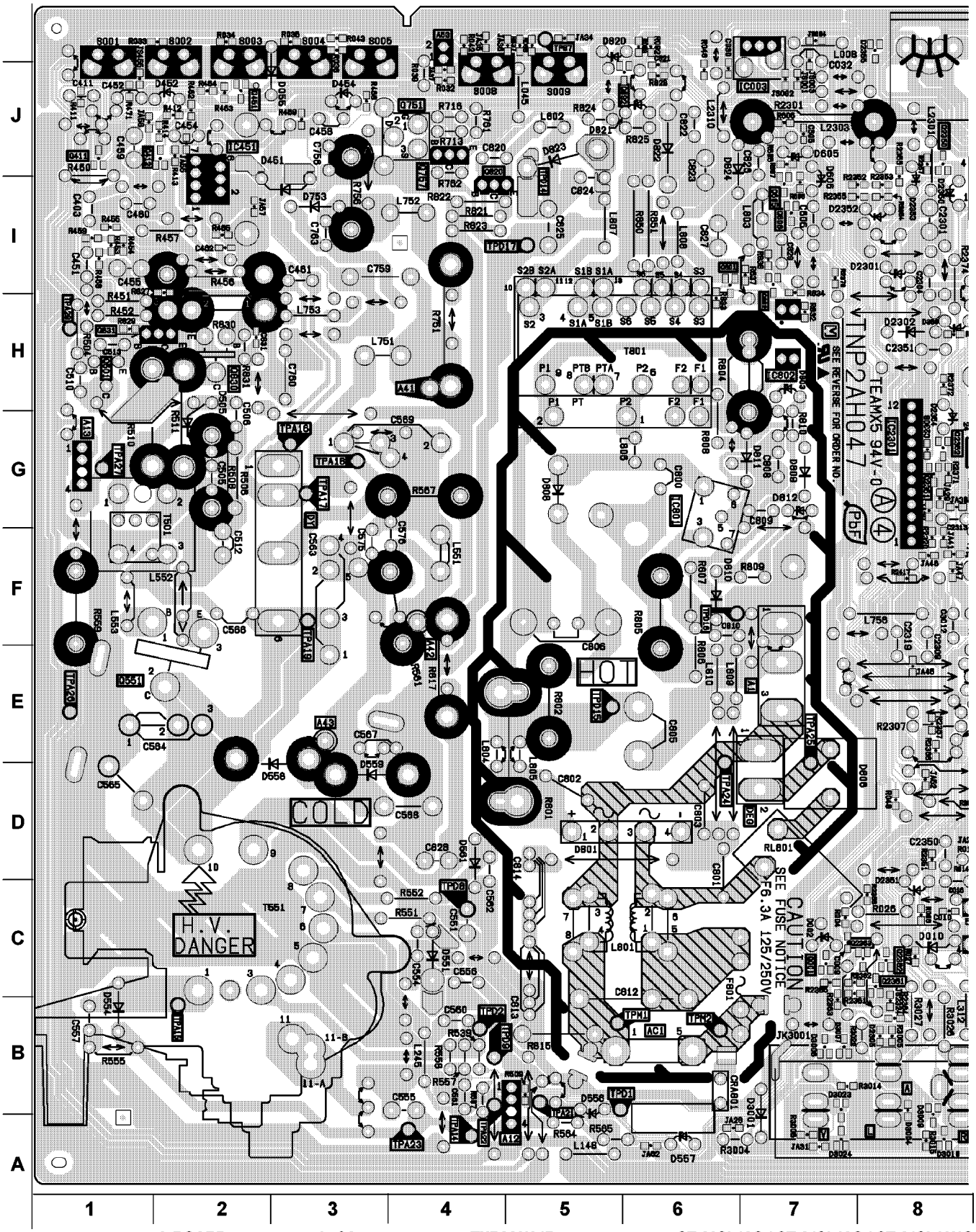

A-Board (bottom side)

# 15 Reference for PDF colors

| DESCRIPTION OF PDF LINK COLORS | |
|---|---|
| TYPE | DESTINATION |
| SCHEMATIC | |
| YELLOW ON IC | IC ON PCB |
| YELLOW ON CONNECTOR | CONNECTOR ON PCB |
| YELLOW ON SCHEMATIC | PCB |
| CYAN | WAVEFORM |
| GREEN ON SIDE | SCHEMATIC CONTINUED |
| GREEN ON CONNECTOR | CONNECTOR CONNECTION |
| BLUE ON IC | VOLTAGE |
| PCB | |
| BLUE ON IC | IC ON SCHEMATIC |
| BLUE ON CONNECTOR | CONNECTOR ON SCHEMATIC |
| BLUE ON PCB | SCHEMATIC |
| GREEN ON SIDE | PCB CONTINUED |
| BLOCK DIAGRAMS | |
| GREEN ON IC | IC ON SCHEMATIC |
| GREEN ON SIDE | BLOCK DIAGRAM CONTINUED |

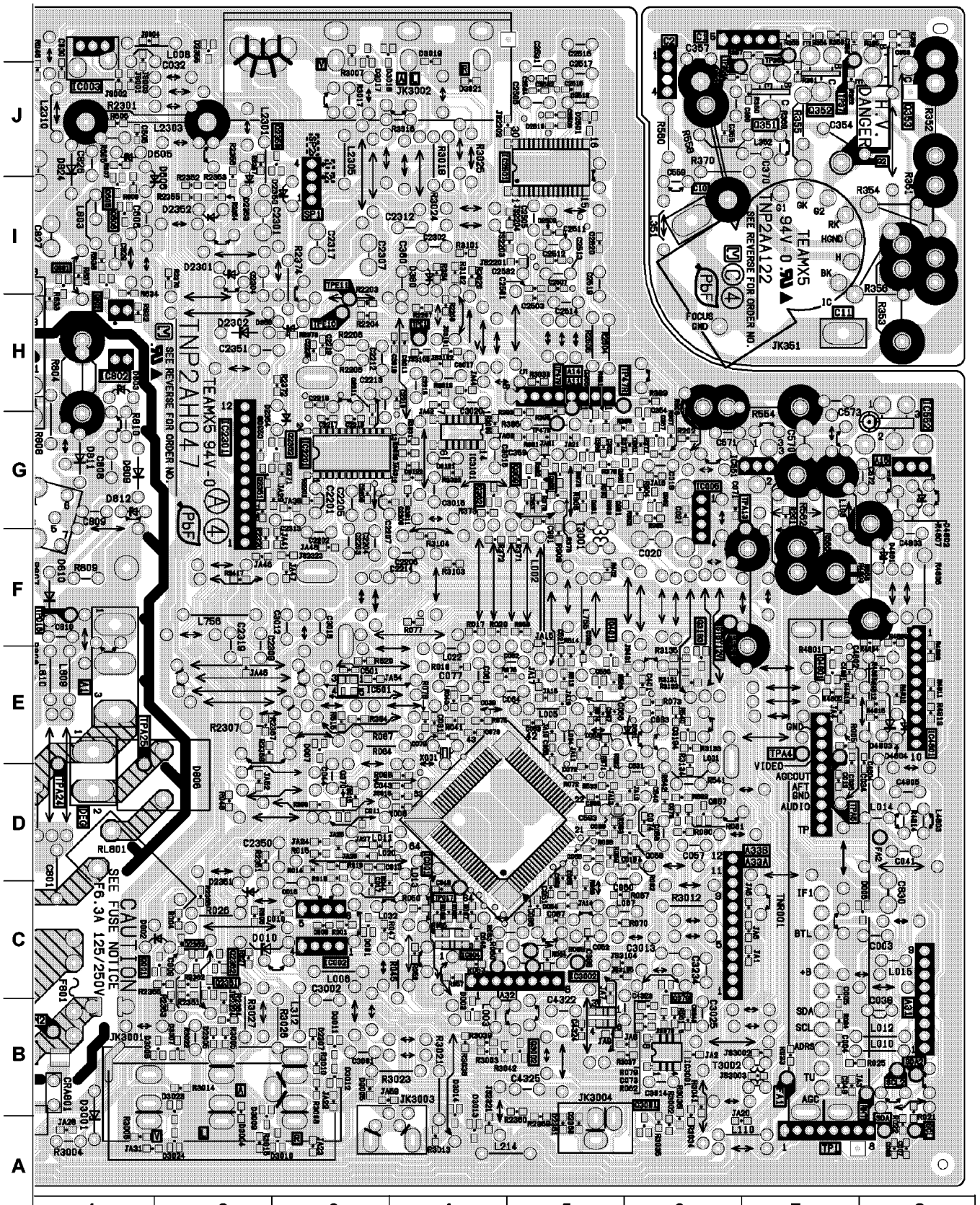
# 16 Conductor views

# 16.1. A-Board printed circuit (left side)

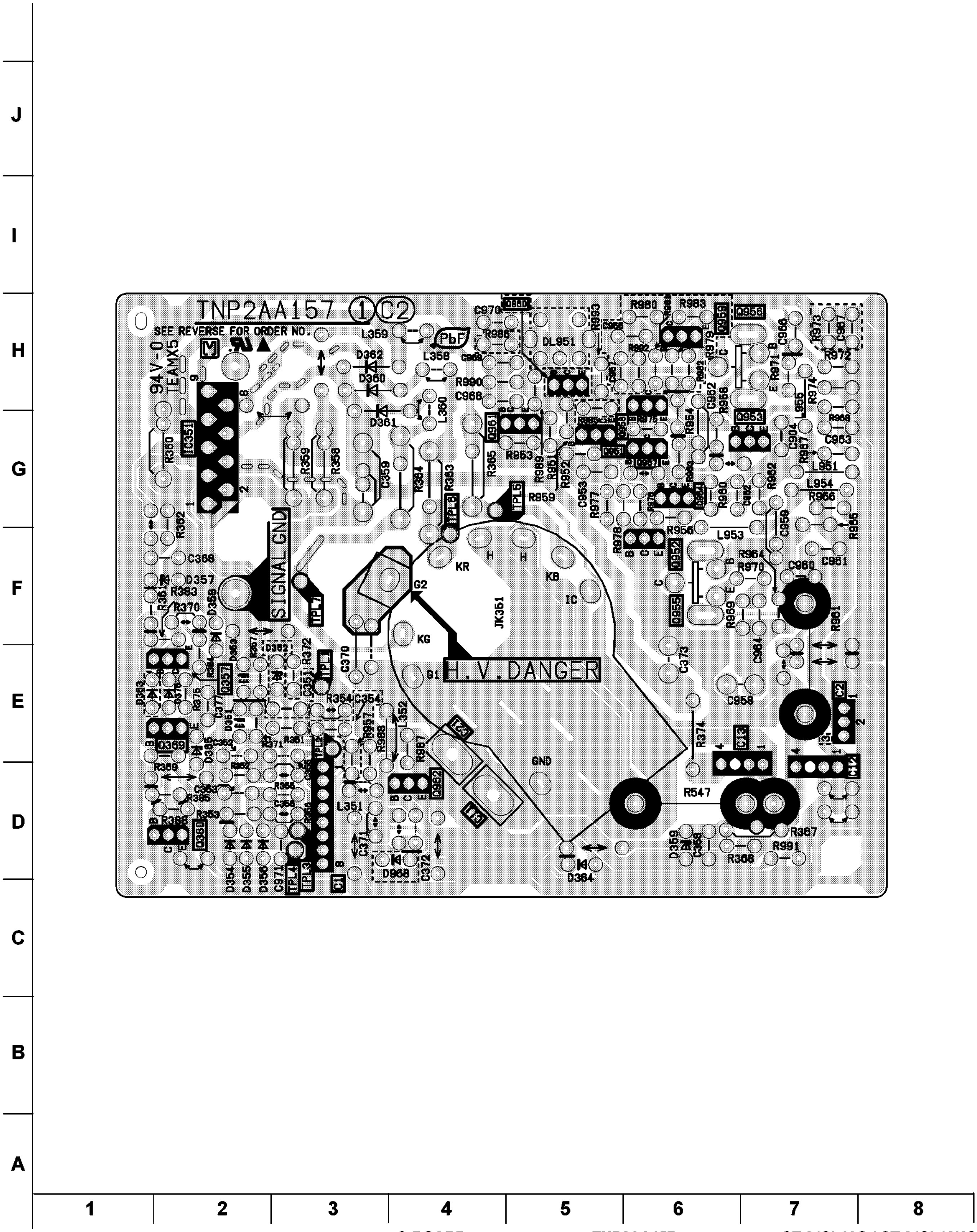



A-BOARD 1 of 2 TNP2AH047 CT-20SL13G / CT-24SL13G / CT-24SL13UG

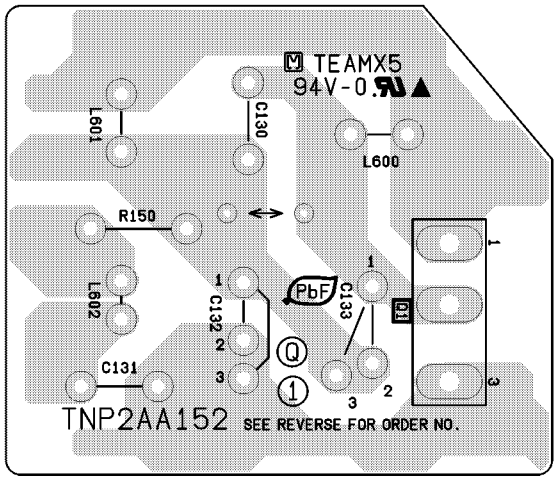
# 16.2. A-Board & C-Board printed circuit (right side)



## 16.3. C-Board printed Circuit (24” models)



## 16.4. Q-Board printed circuit (24” models)



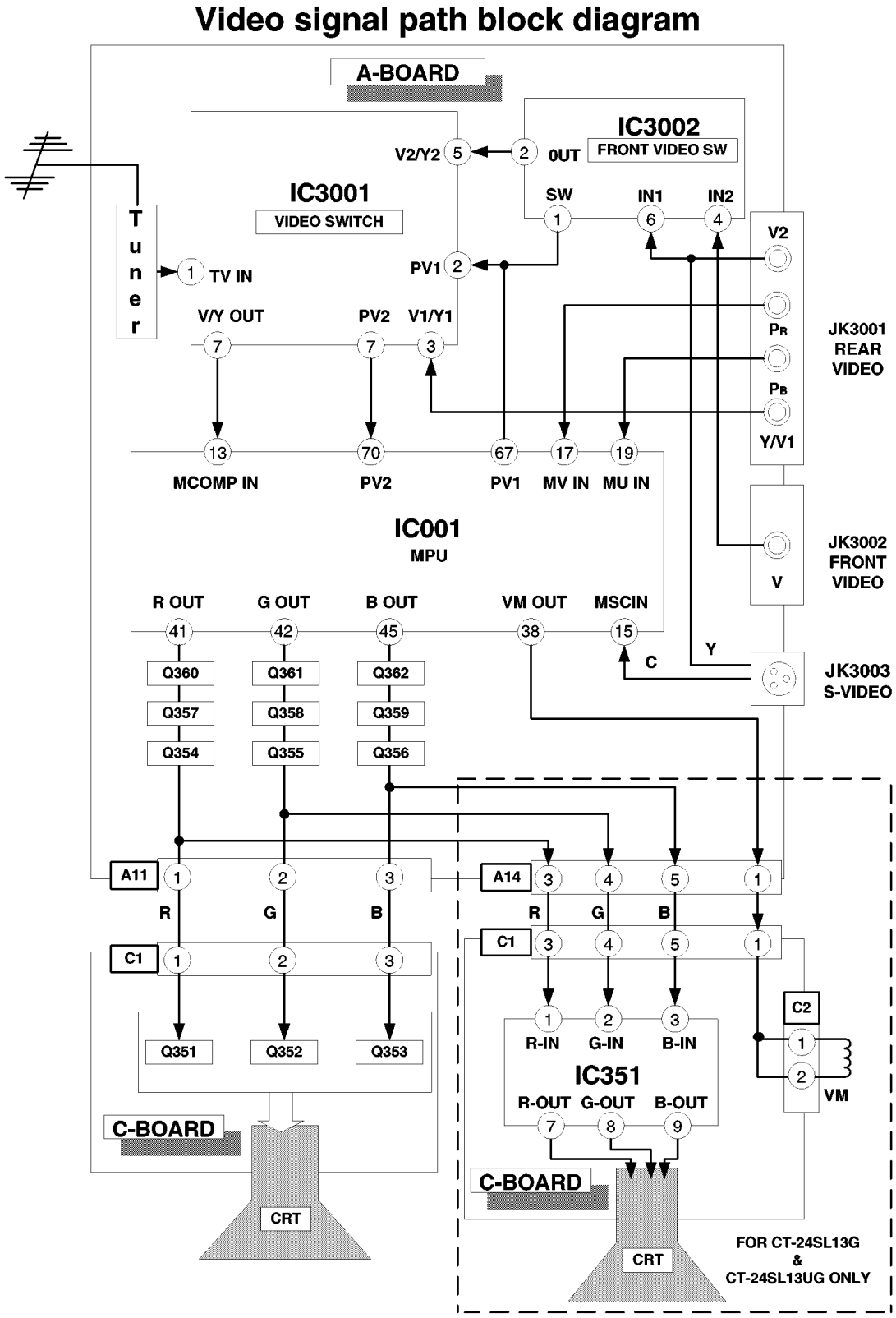

J I H G F E D C B A

1 2 3 4 5 6 7 8

Q-BOARD TNP2AA152 CT-24SL13G / CT-24SL13UG

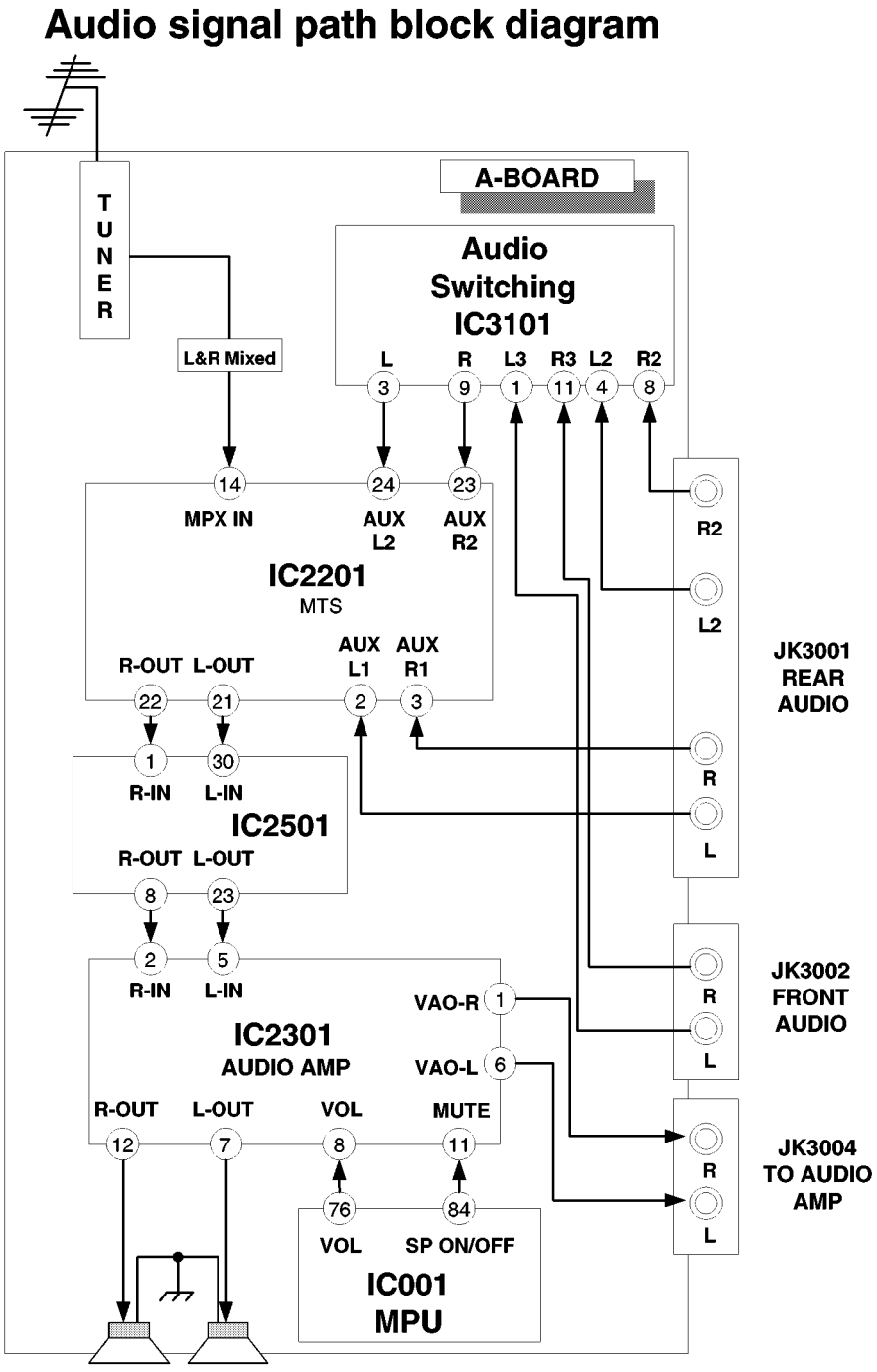
# 17 Block diagrams

## 17.1. Video signal block diagram




CT-20SL13G/CT-24SL13G & CT-24SL13UG

## 17.2. Audio signal block diagram




CT-20SL13G/CT-24SL13G & CT-24SL13UG

# 18 Schematics

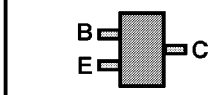
## 18.1. English schematic notes

# Notes:

**IMPORTANT SAFETY NOTICE**

THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES THAT ARE IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS DESIGNATED WITH A ⚠ IN THE SCHEMATIC.

**CHIP TRANSISTOR LEAD DESIGNATION**




**SCHEMATIC NOTES**

1. Resistors are carbon 1/4W unless noted otherwise.
2. Capacitors are ceramic 50V unless noted otherwise.
3. Coil value notes is inductance in μH.
4. Test point indicated by ; Test point but no pin .
5. Components indicated with ⚠ are critical parts and replacement should be made with manufacture specified replacement parts only.
6. ▬ (**BOLD LINE**) indicates the route of B+ supply.
7. The schematic diagrams are current at the time of printing and are subject to change without notice.
8. Ground symbol ⏚ indicates **HOT GROUND CONNECTION**; ⏚ indicates COLD GROUND.

*NOTE: All other component symbols are used for engineering design purposes.*

**VOLTAGE MEASUREMENTS**

1. Voltage measurement:
   - AC input to the Receiver is 120V. NTSC (HD, 1125i & 525P when applicable) signal generator is connected to the antenna of the Receiver. (Color bar pattern of 100 IRE white and 7.5 IRE black.)
   - All Picture and Audio adjustments are set to Normalize.
     TV ANT/CABLE - (Set-Up Menu) in TV/ANT Mode
     Volume - Min.
     TV/Video SW - TV position
     Audio Mode - Stereo
   - Voltage readings are nominal and may vary ±10% on active devices. Some voltage reading will vary with signal strength and picture content.
   - Supply voltages are nominal.
2. Ground symbol ⏚ indicates ground lead connection of meter.
   Incorrect ground connection will result in erroneous readings.

*CAUTION: **Incorrect ground connection of the test equipment will result in erroneous readings.***

**WAVEFORM MEASUREMENTS**

1. ③ indicates waveform measurement. (Measurement can be taken at the best accessible location in common to the indicated point.)
2. Taken with an NTSC signal generator connected to the antenna terminal. (NTSC color bar pattern of 8 bars of EIA colors, 100 IRE white and 7.5 IRE black.)
3. Customer Controls (Picture/Audio Menu) are set to Normalize. Volume is set to "MIN".
4. All video and color waveforms are taken with a wideband scope and a probe with low capacitance (10 to 1). Shape and peak altitudes may vary depending on the type of Oscilloscope used and its settings.
5. Ground symbol ⏚ shown on waveform number indicates (Hot) ground lead connection of the Oscilloscope.

*CAUTION: Incorrect ground connection of the test equipment will result in erroneous readings.*

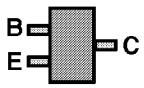
## 18.2. Notas de esquemáticos en español

# Notas

**NOTA DE SEGURIDAD**

LOS DIAGRAMAS ELÉCTRICOS INCLUYEN CARACTERÍSTICAS ESPECIALES MUY IMPORTANTES PARA LA PROTECCIÓN CONTRA RAYOS-X, QUEMADURAS Y DESCARGAS ELÉCTRICAS. CUANDO SE DE SERVICIO ES IMPORTANTE USAR PARA REEMPLAZO DE COMPONENTES CRITICOS, SOLO PARTES ESPECIFICADAS POR EL FABRICANTES. LOS COMPONENTES CRITICOS ESTAN SEÑALADOS EN LOS DIAGRAMAS POR EL SIMBOLO ⚠.

**IDENTIFICACIÓN DE TERMINALES PARA TRANSISTORES EN *CHIP***




**NOTAS DE LOS DIAGRAMAS**

1. Las Resistencias son de Carbón de 1/4W, a menos que se indique otra característica.
2. Los Capacitores son de Cerámica para 50V, a menos que se indique otra característica.
3. El valor indicado de las Bobinas es la inductancia expresada en µH.
4. Los puntos de prueba en la terminal de algún componente son indicados por ⏐. Los puntos de prueba fuera de los componentes se indican con ⏐.
5. Los componentes señalados con el símbolo ⚠ son considerados componentes críticos y deben ser reemplazados sólo con las partes especificadas por el fabricante.
6. ▬ (**LINEA GRUESA**) indica las líneas de alimentación de los Voltajes B+.
7. Los diagramas eléctricos están sujetos a cambio sin previo aviso.
8. El símbolo ⏚ indica que es una conexión a **Tierra Caliente** y el símbolo ⏚ indica conexión a **Tierra Fría**.

***NOTA: Los demas símbolos de componentes incluidos son usados con fines de diseño.***

**MEDICIÓN DE VOLTAJES**

1. Medición de voltaje:
   - El voltaje de entrada al Receptor es de 120V de Corriente Alterna. Un generador de patrones con formato NTSC se conecta a la entrada de la antena. (Patrón de Barras de Colores con 100 IREs para el Blanco y 7.5 IREs para el Negro.)
   - Los ajustes de los Menus Picture y Audio se normalizan.
     En el Menú Set-Up, en la opción ANTENA, se selecciona el modo de CABLE.
     El nivel de Volumen se minimiza.
     De los modos TV y Video, seleccionar el modo TV.
     Seleccionar modo Estereo del Audio.
   - Las mediciones de los voltajes son nominales y pueden variar hasta 10% en componentes en funcionamiento. Las lecturas de los voltajes pueden variar por la potencia de la señal y el contenido de la imagen.
   - Las fuentes de voltajes son nominales.
2. El símbolo ⏚ indica el tipo de tierra que se utiliza en la conexión del medidor.

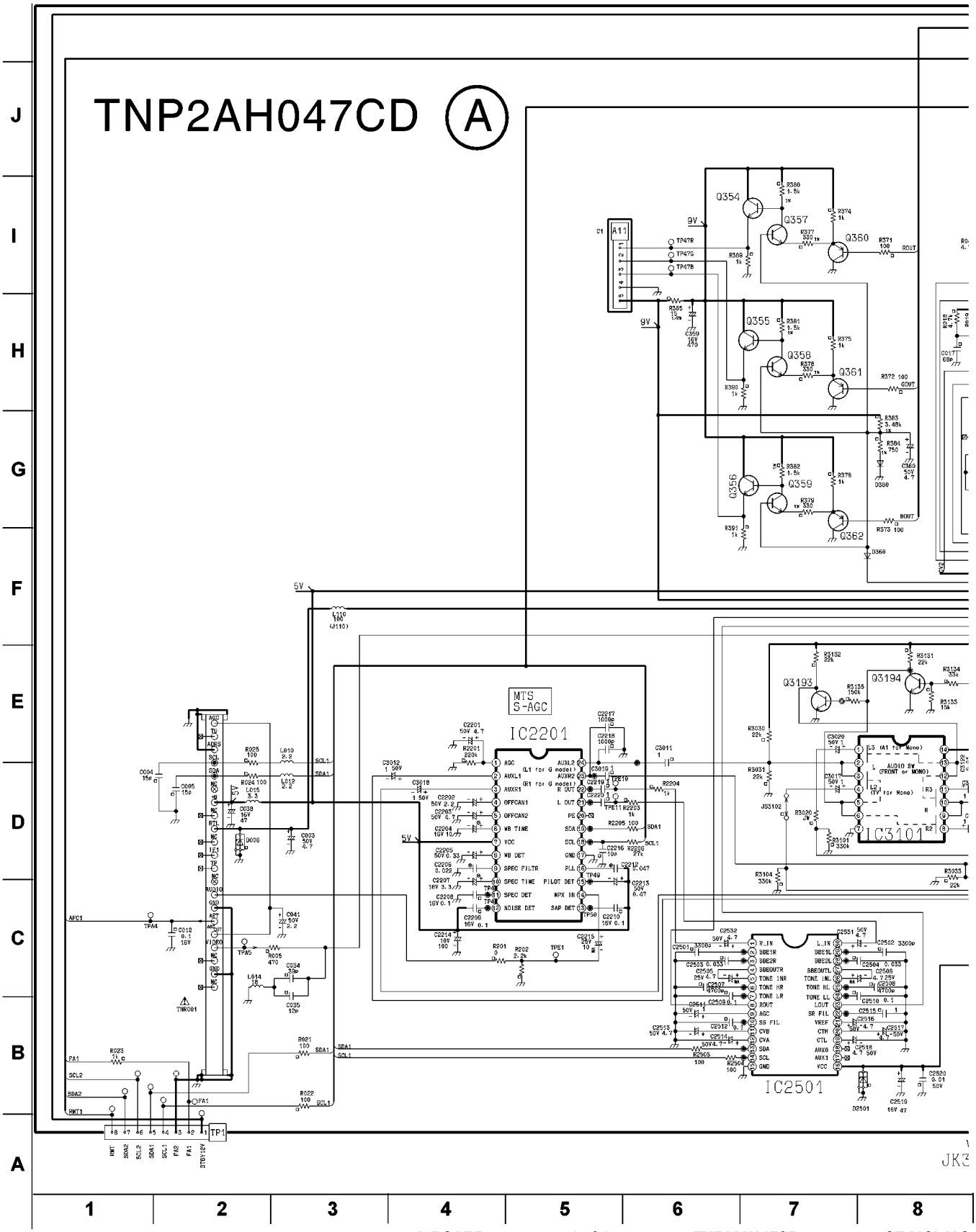
***PRECAUCION: Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.***

**MEDICIÓN DE FORMAS DE ONDA**

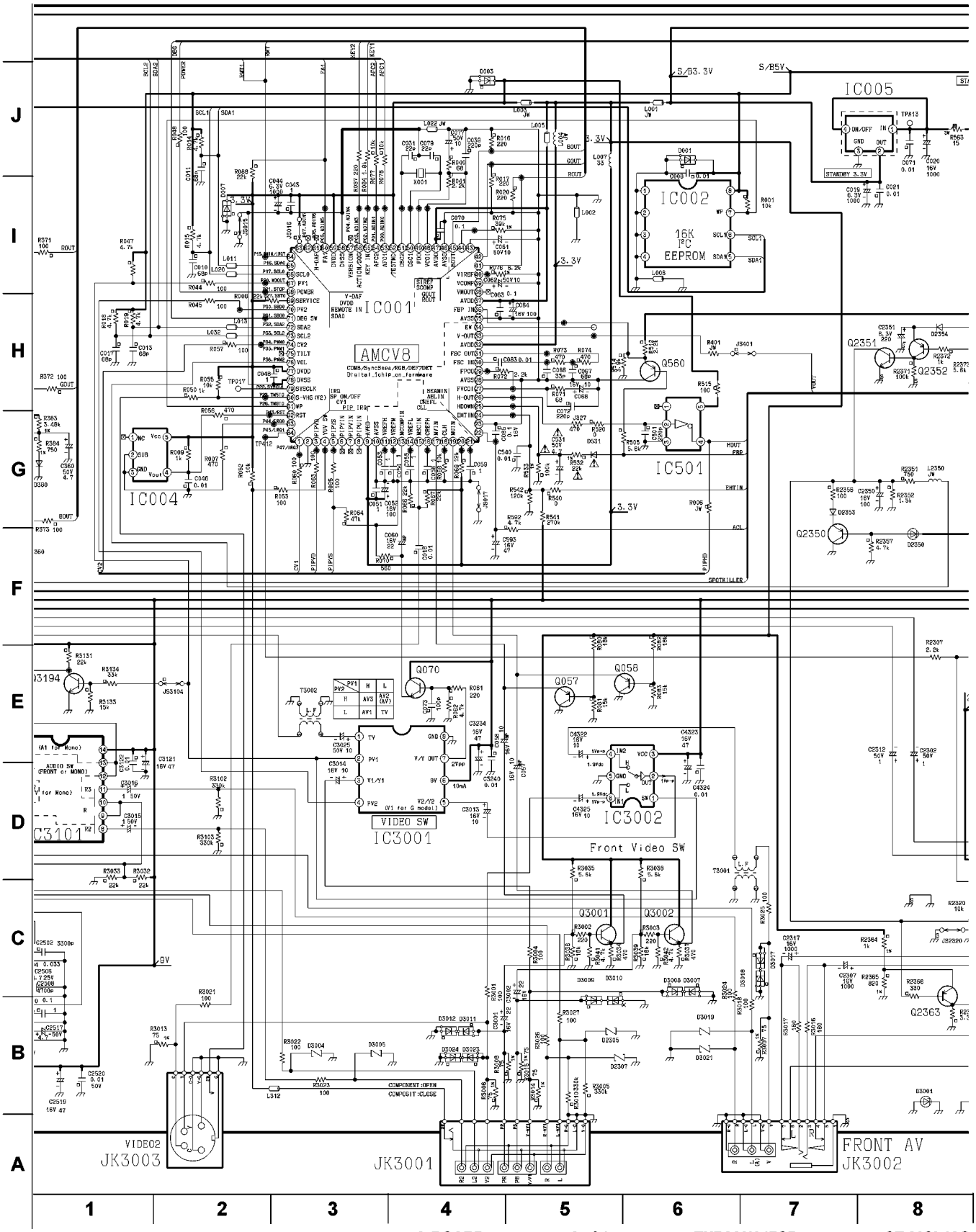
1. Un símbolo como ③🔍 indica el punto para medir una señal. (La medición puede hacerse en el punto con mayor accesibilidad, siempre que sea común al indicado.)
2. Se midieron utilizando un generador con formato NTSC conectado a la terminal de la antena. (Patrón de 8 Barras de Colores EAI, formato NTSC de 100 IREs para el Blanco y 7.5 IREs para el Negro.)
3. Los ajustes de usuario de los Menus PICTURE y AUDIO se normalizaron. Posteriormente el nivel de volumen se ajusta al mínimo.
4. Las formas de onda de Video y Color fueron tomadas con un osciloscopio de banda alta y con un punta de prueba de baja capacitancia (10 a 1). La forma y amplitud de las ondas puede variar según el tipo de osciloscopio que se utilice y sus características.
5. El símbolo de tierra ⏚ que aparece junto al número de la forma de onda, indica que se utiliza conexión a **Tierra Caliente** en el extremo negativo de la punta de prueba.

***PRECAUCION: Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.***

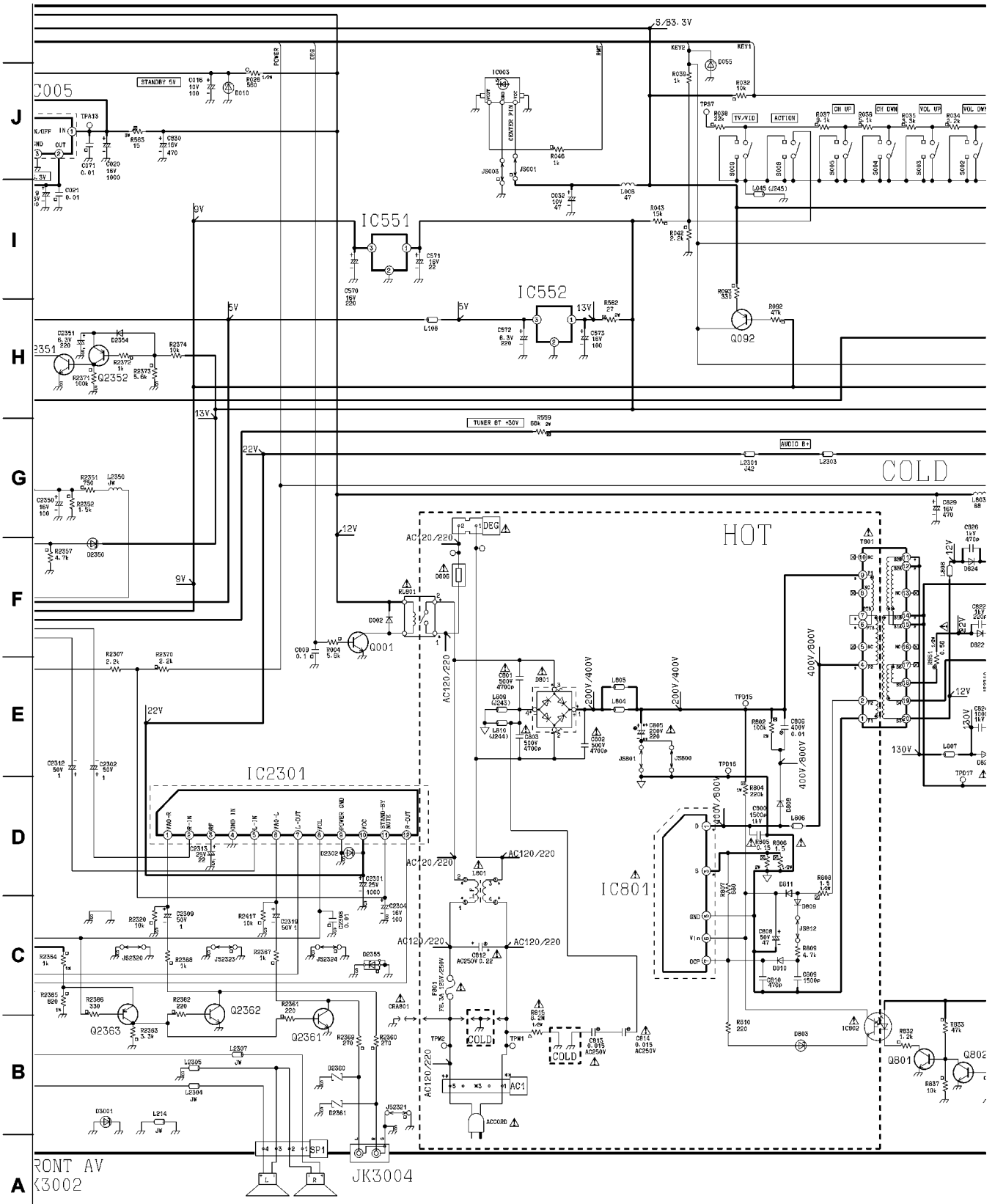
## 18.3. A-Board schematic TNP2AH047CD (page 1 of 4)



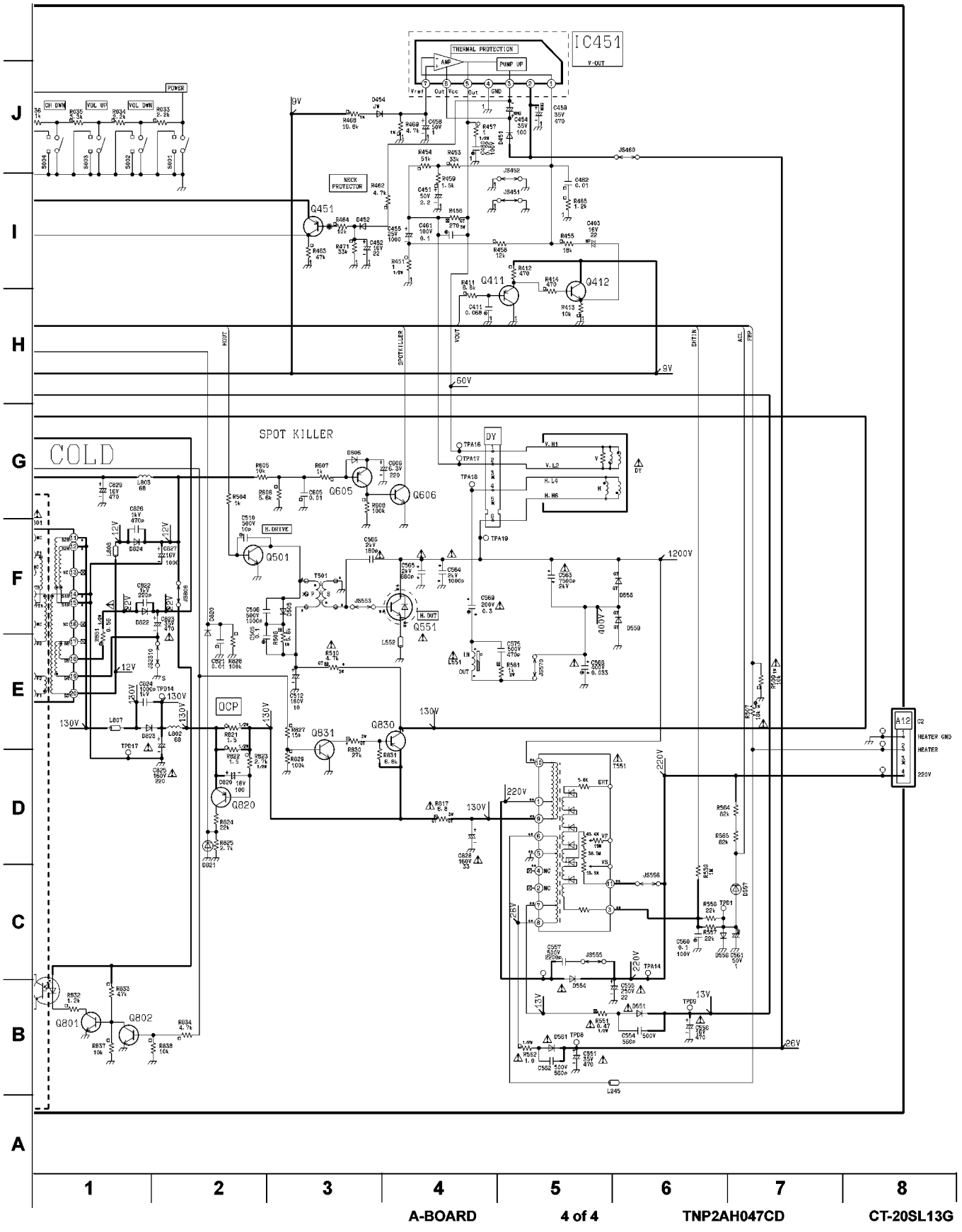
# 18.4. A-Board schematic TNP2AH047CD (page 2 of 4)



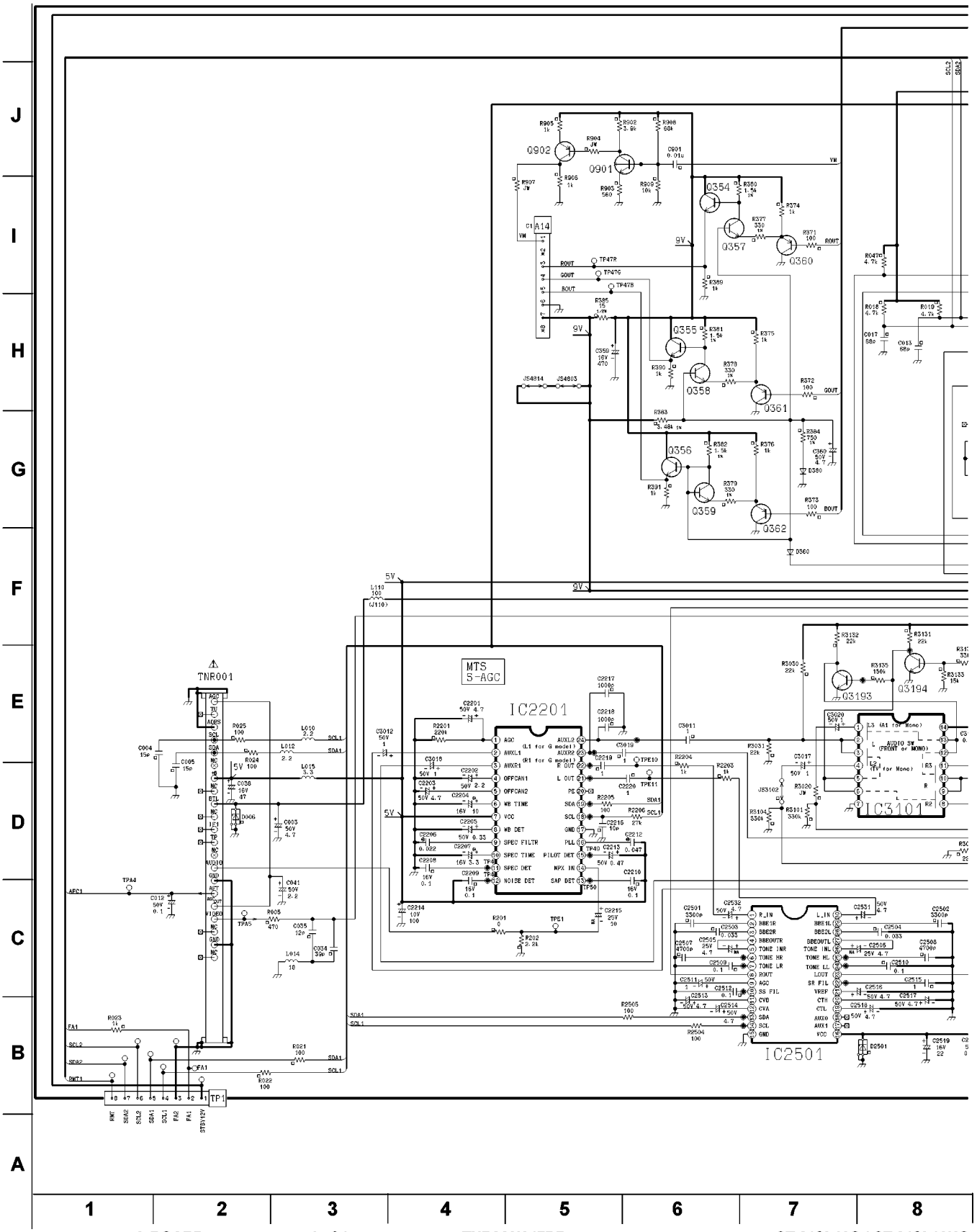
# 18.5. A-Board schematic TNP2AH047CD (page 3 of 4)



# 18.6. A-Board schematic TNP2AH047CD (page 4 of 4)

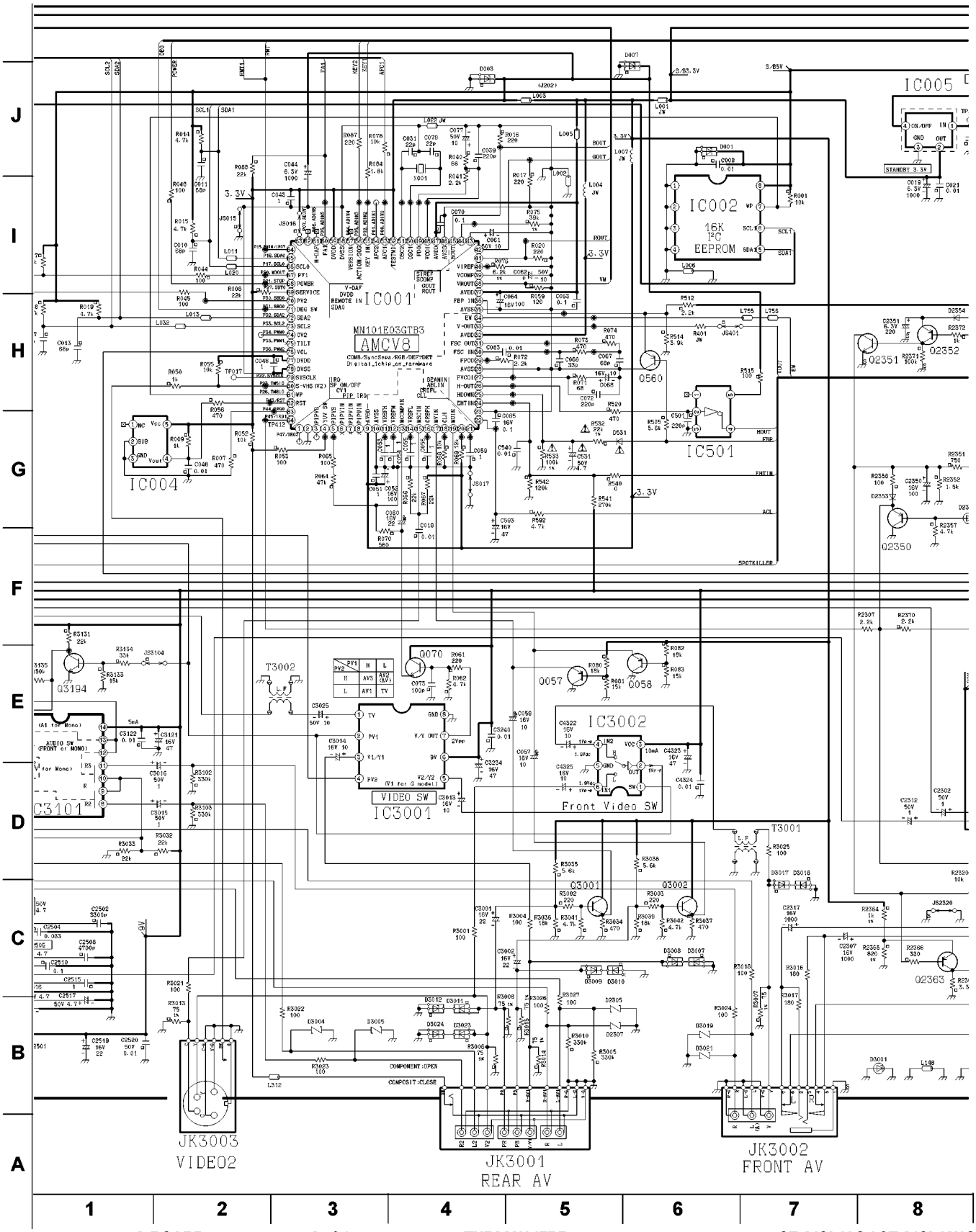


# 18.7. A-Board schematic TNP2AH047DB (page 1 of 4)

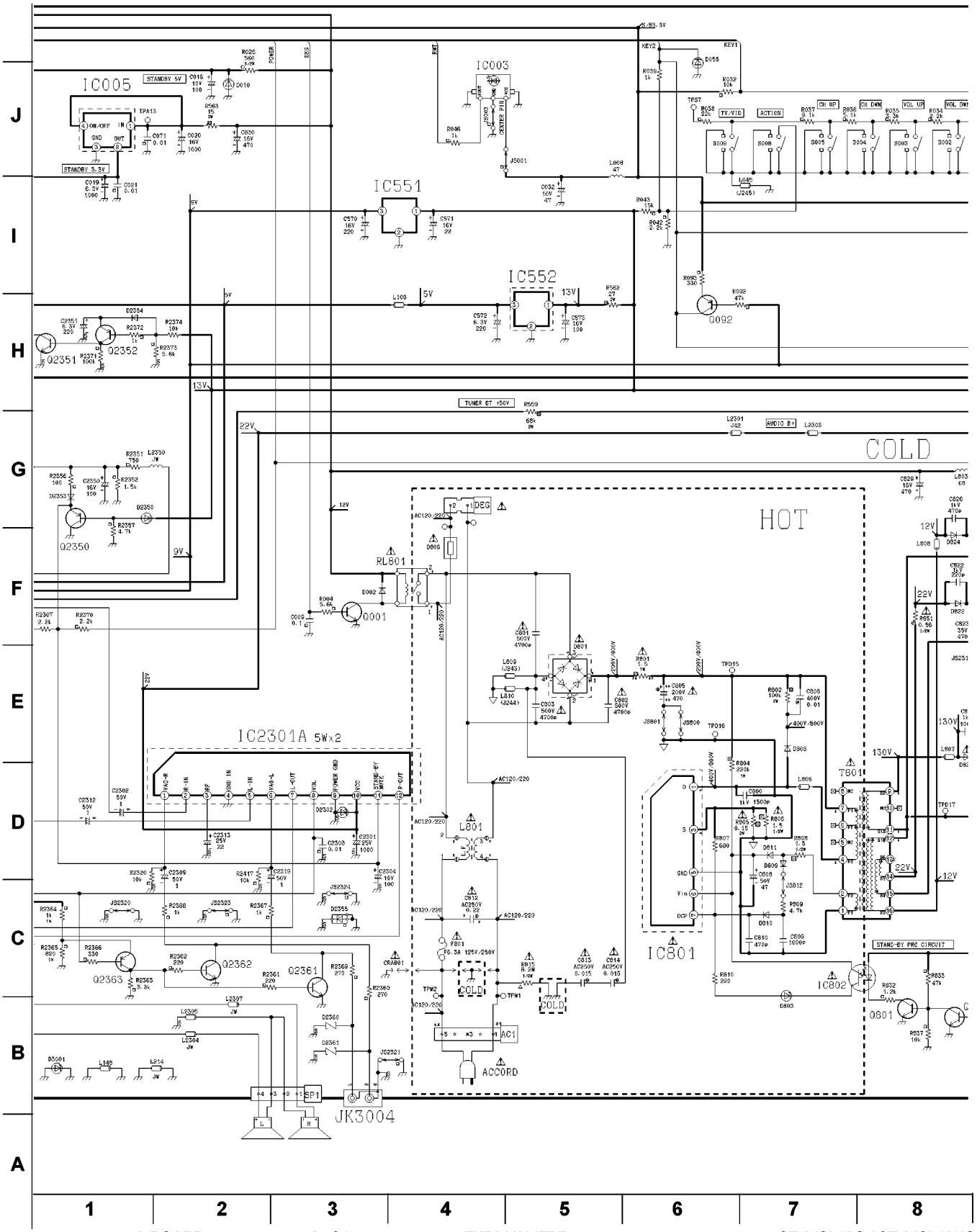



A-BOARD 1 of 4 TNP2AH047DB CT-24SL13G / CT-24SL13UG

# 18.8. A-Board schematic TNP2AH047DB (page 2 of 4)

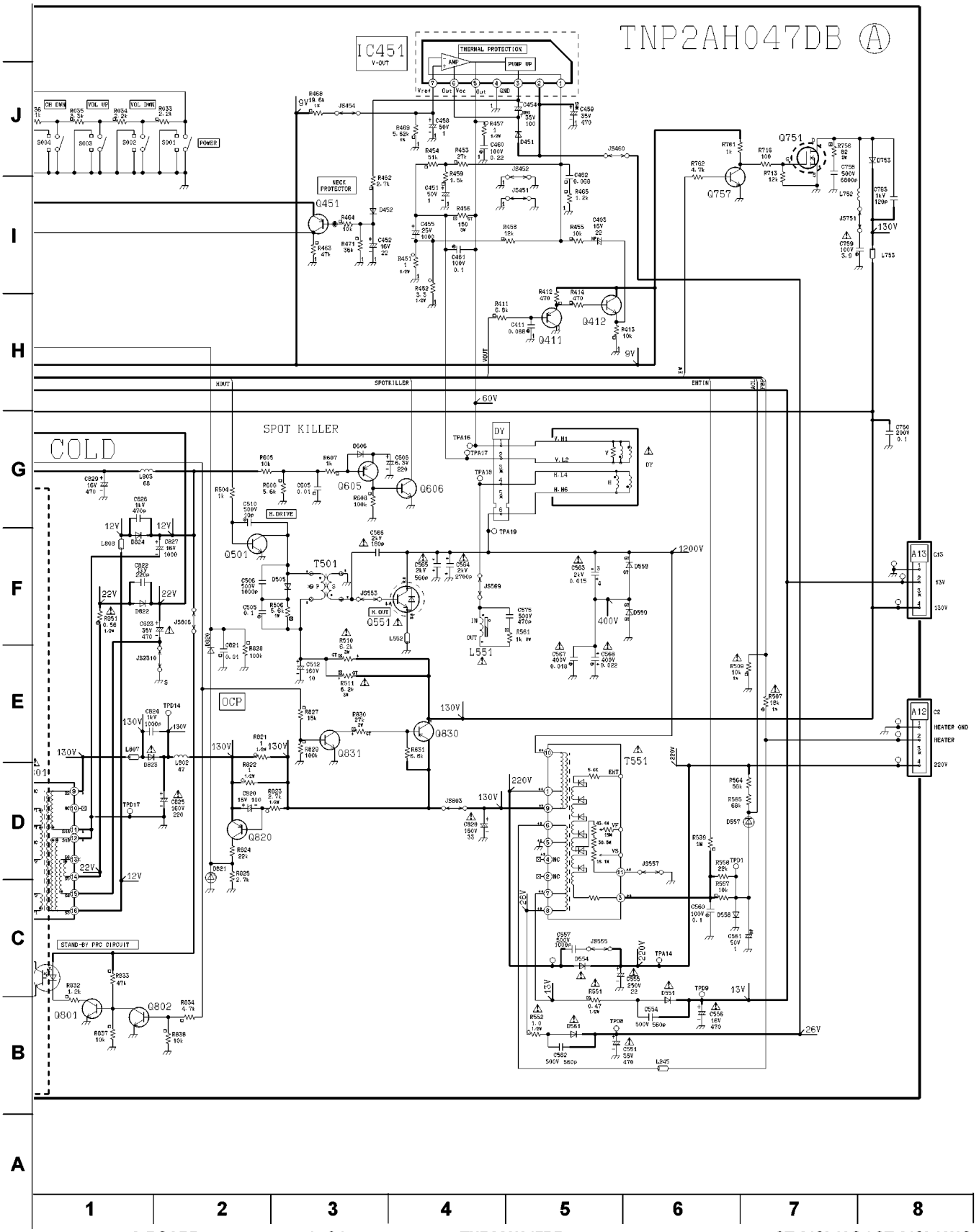


# 18.9. A-Board schematic TNP2AH047DB (page 3 of 4)

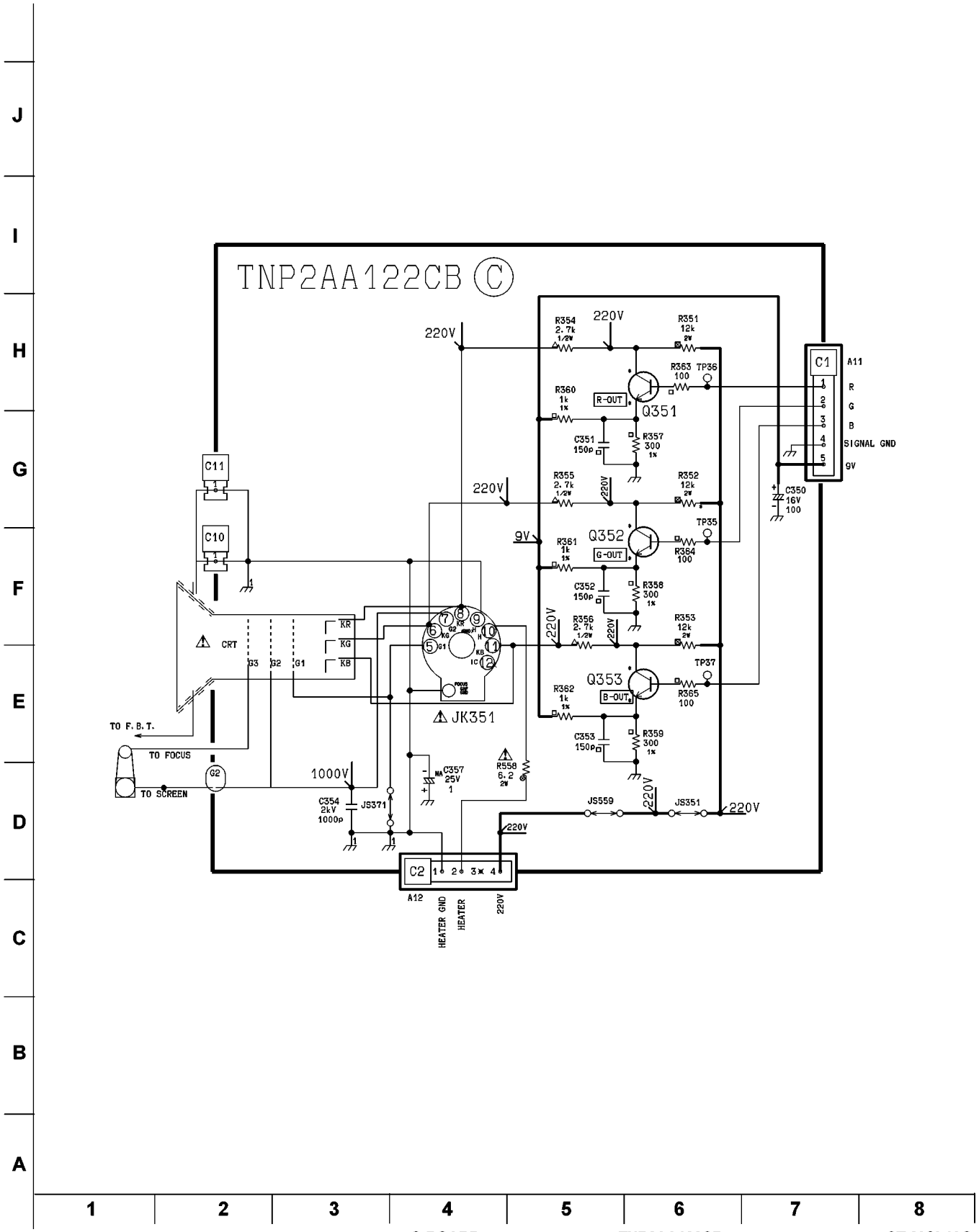



A-BOARD 3 of 4 TNP2AH047DB CT-24SL13G / CT-24SL13UG

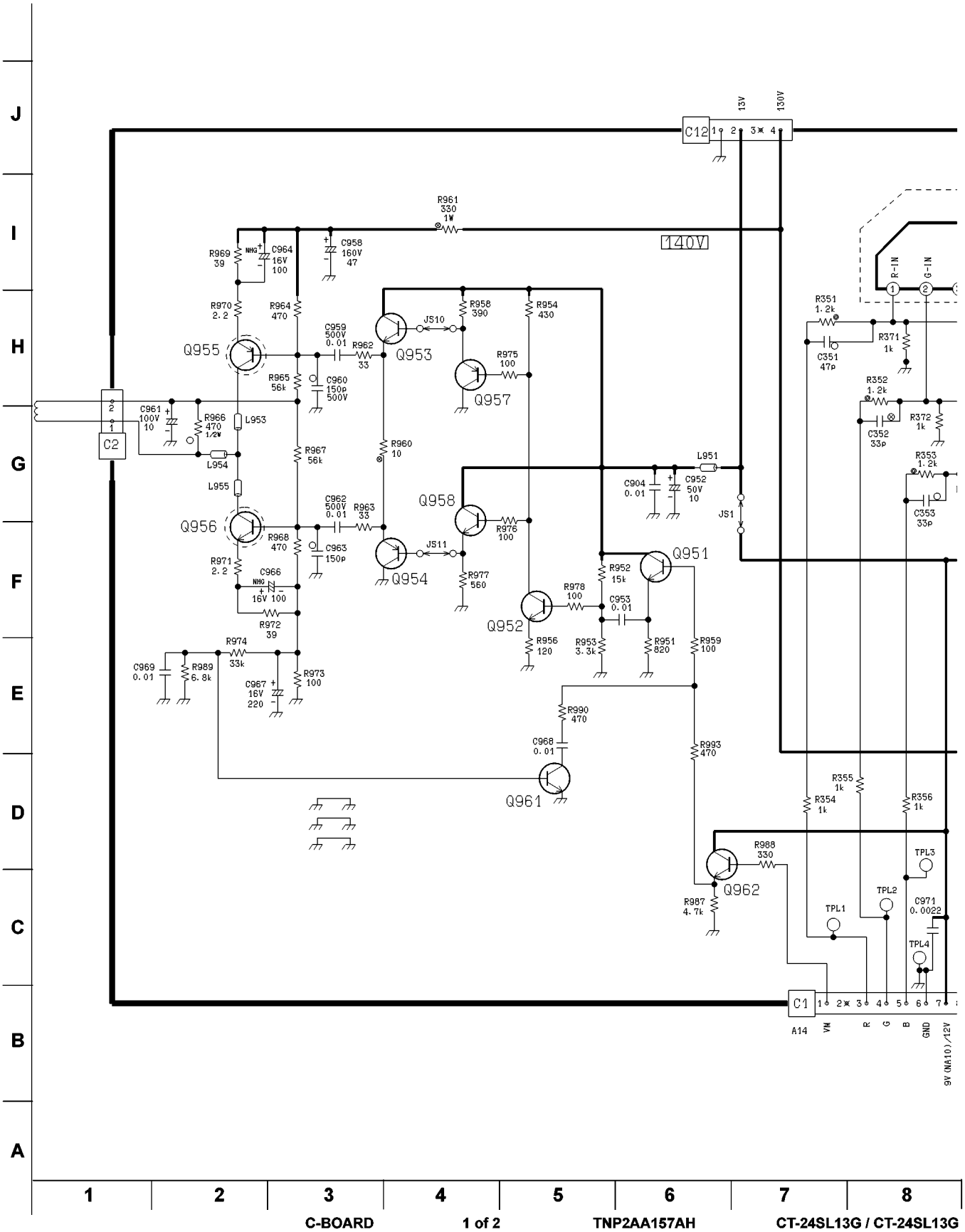
# 18.10. A-Board schematic TNP2AH047DB (page 4 of 4)



## 18.11. C-Board schematic TNP2AA122CB

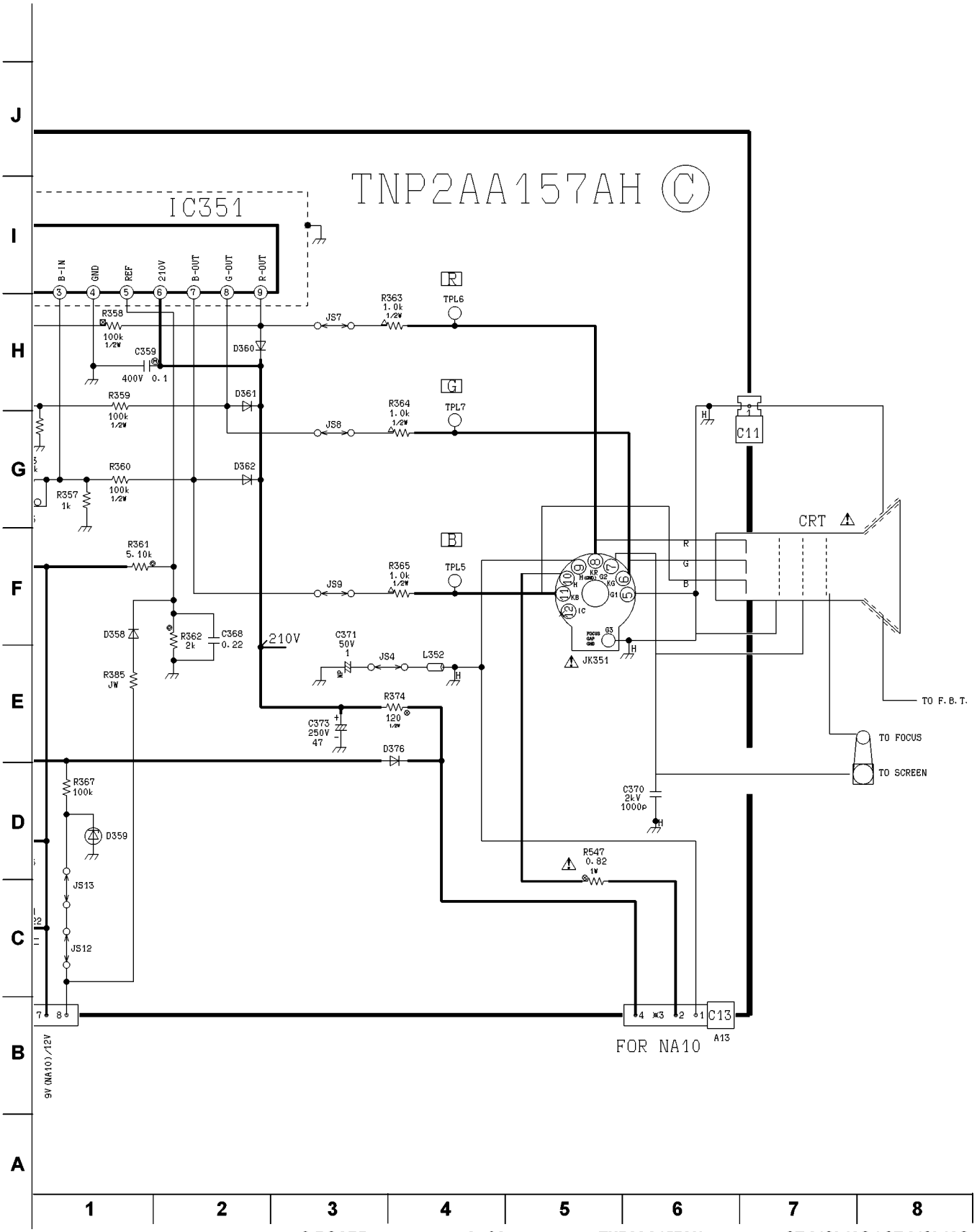


# 18.12. C-Board schematic TNP2AA157AH (page 1 of 2)



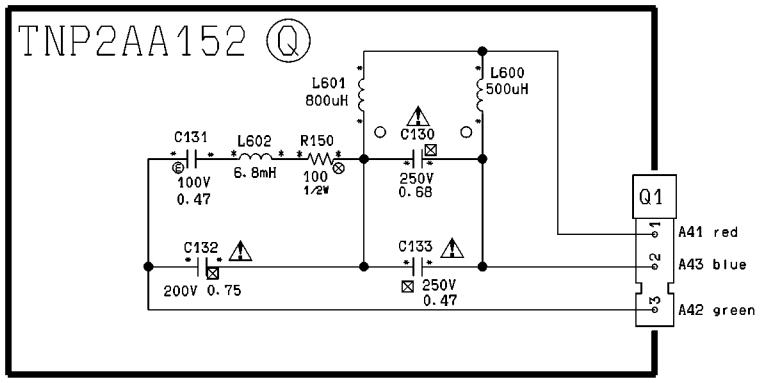

C-BOARD 1 of 2 TNP2AA157AH CT-24SL13G / CT-24SL13G

# 18.13. C-Board schematic TNP2AA157AH (page 2 of 2)




C-BOARD 2 of 2 TNP2AA157AH CT-24SL13G / CT-24SL13G

## 18.14. Q-Board schematic TNP2AA152




J I H G F E D C B A

1 2 3 4 5 6 7 8

Q-BOARD TNP2AA122 CT-24SL13G / CT-24SL13UG

# 18.15. Voltages

## A - BOARD - TNP2AH047

### IC001

| | | | |
|---|---|---|---|
| 1 | 0.00 | 43 | 2.50 |
| 2 | 0.00 | 44 | 1.70 |
| 3 | 0.00 | 45 | 0.00 |
| 4 | 0.00 | 46 | 0.00 |
| 5 | 0.00 | 47 | 3.30 |
| 6 | 1.20 | 48 | 1.90 |
| 7 | 1.20 | 49 | 1.90 |
| 8 | 1.30 | 50 | 1.60 |
| 9 | 3.30 | 51 | 1.70 |
| 10 | 0.00 | 52 | 3.30 |
| 11 | 2.70 | 53 | 1.70 |
| 12 | 1.50 | 54 | 1.40 |
| 13 | 1.40 | 55 | 3.30 |
| 14 | 0.40 | 56 | 1.40 |
| 15 | 1.60 | 57 | 0.00 |
| 16 | 2.20 | 58 | 0.00 |
| 17 | 1.70 | 59 | 3.30 |
| 18 | 1.70 | 60 | 3.30 |
| 19 | 1.40 | 61 | 3.30 |
| 20 | 1.40 | 62 | 0.70 |
| 21 | 1.00 | 63 | 3.30 |
| 22 | 2.60 | 64 | 3.30 |
| 23 | 0.00 | 65 | 3.40 |
| 24 | 1.90 | 66 | 3.50 |
| 25 | 1.90 | 67 | 0.10 |
| 26 | 1.40 | 68 | 3.20 |
| 27 | 1.28 | 69 | 0.00 |
| 28 | 0.00 | 70 | 0.00 |
| 29 | 1.30 | 71 | 0.00 |
| 30 | 1.80 | 72 | 5.20 |
| 31 | 1.00 | 73 | 5.20 |
| 32 | 3.30 | 74 | 0.00 |
| 33 | 1.70 | 75 | 0.00 |
| 34 | 0.80 | 76 | 0.00 |
| 35 | 0.00 | 77 | 3.30 |
| 36 | 0.60 | 78 | 0.00 |
| 37 | 3.30 | 79 | 0.00 |
| 38 | 3.30 | 80 | 3.30 |
| 39 | 2.30 | 81 | 5.20 |
| 40 | 1.70 | 82 | 3.30 |
| 41 | 0.40 | 83 | 0.00 |
| 42 | 0.40 | 84 | 3.30 |

### IC002

| | |
|---|---|
| 1 | 0.00 |
| 2 | 0.00 |
| 3 | 0.00 |
| 4 | 0.00 |
| 5 | 3.40 |
| 6 | 3.40 |
| 7 | 5.20 |
| 8 | 5.20 |

### IC003

| | |
|---|---|
| 1 | 0.00 |
| 2 | 3.31 |
| 3 | 3.27 |

### IC004

| | |
|---|---|
| 1 | 0.00 |
| 2 | 0.00 |
| 3 | 0.00 |
| 4 | 3.30 |
| 5 | 3.30 |

### IC005

| | |
|---|---|
| 1 | 9.10 |
| 2 | 3.30 |
| 3 | 0.00 |
| 4 | 9.10 |

### IC451

| | |
|---|---|
| 1 | 2.00 |
| 2 | 27.80 |
| 3 | 1.20 |
| 4 | 0.00 |
| 5 | 17.60 |
| 6 | 27.90 |
| 7 | 2.00 |

### IC501

| | |
|---|---|
| 1 | 0.00 |
| 2 | 1.35 |
| 3 | 0.00 |
| 4 | 1.05 |
| 5 | 3.30 |

### IC551

| | |
|---|---|
| 1 | 12.20 |
| 2 | 0.00 |
| 3 | 9.00 |

### IC552

| | |
|---|---|
| 1 | 7.50 |
| 2 | 0.00 |
| 3 | 5.00 |

### IC801↓

| | |
|---|---|
| 1 | -21.00 |
| 2 | N/C |
| 3 | 0.10 |
| 4 | N/C |
| 5 | GND |
| 6 | 32.24 |
| 7 | 1.50 |

### IC802↓

| | |
|---|---|
| 1 | 2.30 |
| 2 | 32.24 |

### IC2201

| | | | |
|---|---|---|---|
| 1 | 1.60 | 13 | 2.80 |
| 2 | 2.20 | 14 | 2.20 |
| 3 | 2.20 | 15 | 2.50 |
| 4 | 2.30 | 16 | 3.50 |
| 5 | 2.40 | 17 | 0.00 |
| 6 | 0.07 | 18 | 3.20 |
| 7 | 5.00 | 19 | 3.40 |
| 8 | 2.50 | 20 | 0.00 |
| 9 | 2.60 | 21 | 2.20 |
| 10 | 0.80 | 22 | 2.20 |
| 11 | 2.30 | 23 | 2.20 |
| 12 | 2.50 | 24 | 2.20 |

### IC2501

| | | | |
|---|---|---|---|
| 1 | 4.40 | 16 | 8.90 |
| 2 | 0.00 | 17 | 0.00 |
| 3 | 0.00 | 18 | 0.00 |
| 4 | 4.50 | 19 | 3.80 |
| 5 | 4.50 | 20 | 3.80 |
| 6 | 4.50 | 21 | 4.40 |
| 7 | 4.50 | 22 | 4.80 |
| 8 | 4.50 | 23 | 4.40 |
| 9 | 1.00 | 24 | 4.50 |
| 10 | 4.50 | 25 | 4.60 |
| 11 | 3.60 | 26 | 4.50 |
| 12 | 3.60 | 27 | 4.50 |
| 13 | 2.90 | 28 | 0.00 |
| 14 | 3.20 | 29 | 0.00 |
| 15 | 0.00 | 30 | 4.40 |

### IC3001

| | |
|---|---|
| 1 | 4.10 |
| 2 | 0.20 |
| 3 | 4.10 |
| 4 | 0.00 |
| 5 | 4.10 |
| 6 | 9.00 |
| 7 | 4.30 |
| 8 | 0.00 |

### IC3002

| | |
|---|---|
| 1 | 0.20 |
| 2 | 4.40 |
| 3 | 8.90 |
| 4 | 5.10 |
| 5 | 0.00 |
| 6 | 5.10 |

### IC2301

| | |
|---|---|
| 1 | 7.50 |
| 2 | 5.60 |
| 3 | 21.00 |
| 4 | 0.00 |
| 5 | 5.60 |
| 6 | 7.50 |
| 7 | 10.60 |
| 8 | 1.30 |
| 9 | 0.00 |
| 10 | 22.70 |
| 11 | 3.20 |
| 12 | 10.20 |

### IC3101

| | |
|---|---|
| 1 | 0.10 |
| 2 | 4.40 |
| 3 | 4.40 |
| 4 | 4.40 |
| 5 | 7.80 |
| 6 | 7.80 |
| 7 | 0.00 |
| 8 | 4.40 |
| 9 | 4.40 |
| 10 | 4.40 |
| 11 | 0.00 |
| 12 | 0.00 |
| 13 | 0.00 |
| 14 | 8.90 |

## A - BOARD - TNP2AH047

| | Q001 | Q057 | Q058 | Q070 | Q092 | Q2350 | Q2361 | Q2362 | Q2363 |
|---|---|---|---|---|---|---|---|---|---|
| B | 0.00 | 1.50 | 1.50 | 4.12 | 8.90 | 5.35 | 0.30 | 0.00 | 1.34 |
| C | 13.00 | 0.00 | 0.00 | 8.90 | 1.40 | 0.00 | 0.00 | 0.10 | 0.00 |
| E | 0.00 | 0.07 | 0.07 | 3.50 | 3.30 | 3.14 | 0.00 | 0.00 | 1.50 |

| | Q3001 | Q3002 | Q3193 | Q3194 | Q354 | Q355 | Q356 | Q357 | Q358 |
|---|---|---|---|---|---|---|---|---|---|
| B | 1.30 | 1.30 | 0.60 | 0.05 | 4.50 | 4.30 | 4.40 | 2.60 | 2.60 |
| C | 3.30 | 3.30 | 0.03 | 7.80 | 8.50 | 8.40 | 8.40 | 4.50 | 4.30 |
| E | 0.70 | 0.70 | 0.00 | 0.00 | 3.80 | 3.60 | 3.70 | 2.00 | 2.00 |

| | Q359 | Q360 | Q361 | Q362 | Q411 | Q412 | Q451 | Q501 | Q551 |
|---|---|---|---|---|---|---|---|---|---|
| B | 2.60 | 0.50 | 0.40 | 0.40 | 2.25 | 2.90 | 5.10 | 0.40 | 0.00 |
| C | 4.40 | 0.00 | 0.00 | 0.00 | 0.00 | 9.00 | 1.40 | 56.80 | 14.70 |
| E | 2.00 | 1.10 | 1.10 | 1.10 | 2.90 | 2.40 | 3.30 | 0.00 | 0.00 |

| | Q560 | Q605 | Q606 | Q801 | Q802 | Q820 | Q830 | Q831 |
|---|---|---|---|---|---|---|---|---|
| B | 0.30 | 4.80 | 0.00 | 0.00 | 0.70 | 130.40 | 129.80 | 0.60 |
| C | 0.00 | 0.00 | 3.30 | 12.52 | 0.00 | 0.00 | 130.40 | 0.20 |
| E | 0.60 | 4.70 | 0.00 | 0.00 | 0.00 | 130.80 | 130.50 | 0.00 |

| | *Q751 |
|---|---|
| G | 7.50 |
| D | 8.90 |
| S | 0.00 |

| | *Q757 |
|---|---|
| B | 0.00 |
| C | 7.60 |
| E | 0.00 |

| | *Q901 | *Q902 |
|---|---|---|
| B | 1.00 | 5.20 |
| C | 5.20 | 2.40 |
| E | 0.40 | 5.80 |

*For models (CT-24SL13 and CT-24SL13UG) only.

## C - BOARD - TNP2AA122 (CT-20SL13G)

| | Q351 | Q352 | Q353 |
|---|---|---|---|
| B | 1.90 | 1.50 | 6.30 |
| C | 8.90 | 5.70 | 8.90 |
| E | 1.50 | 1.50 | 5.70 |

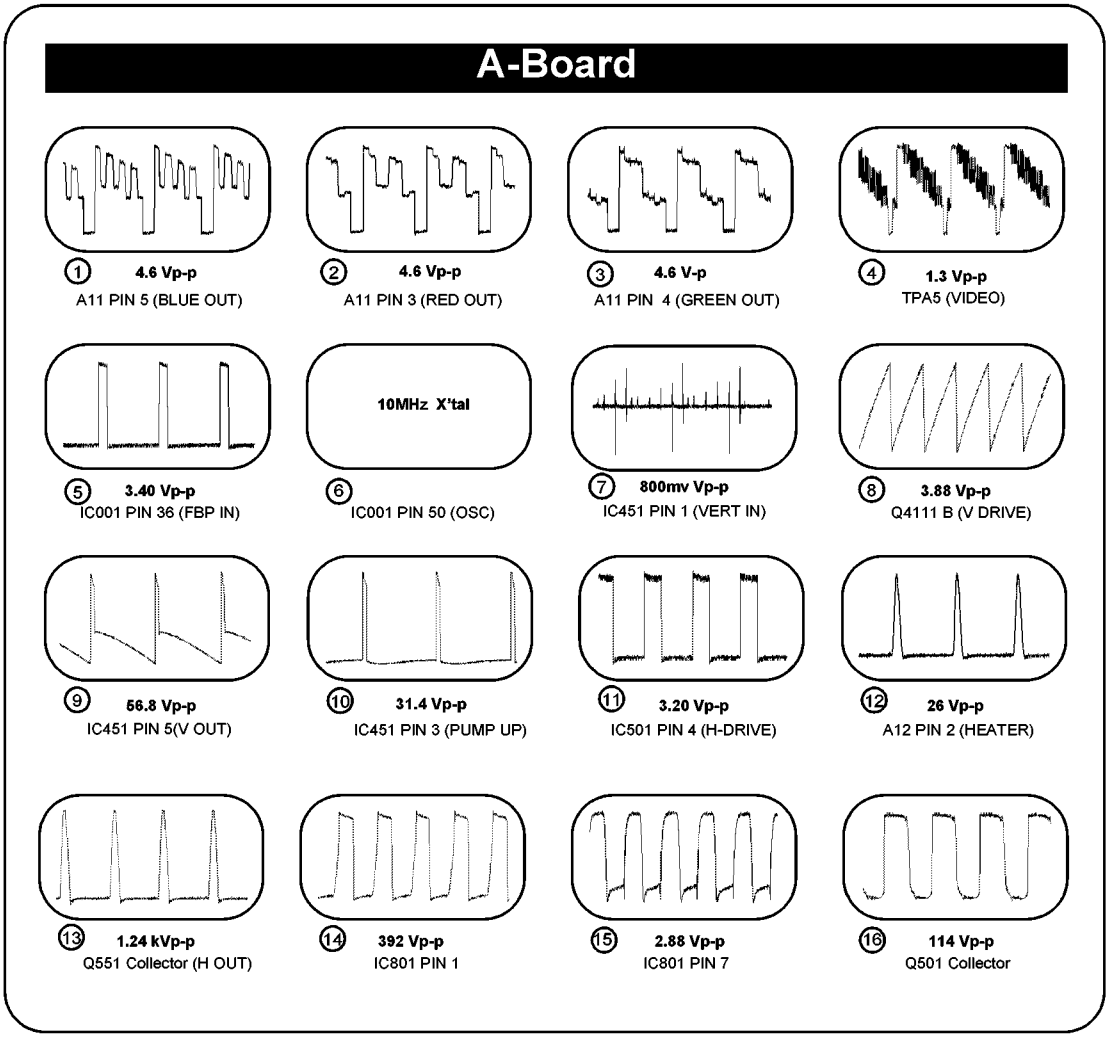
## C - BOARD - TNP2AA157 (CT-24E13G and CT-24E13UG)

| IC351 | |
|---|---|
| 1 | . . . . . 2.40 |
| 2 | . . . . . 2.40 |
| 3 | . . . . . 2.40 |
| 4 | . . . . . 0.00 |
| 5 | . . . . . 2.50 |
| 6 | . . . 216.80 |
| 7 | . . . 145.30 |
| 8 | . . . 152.70 |
| 9 | . . . 151.00 |

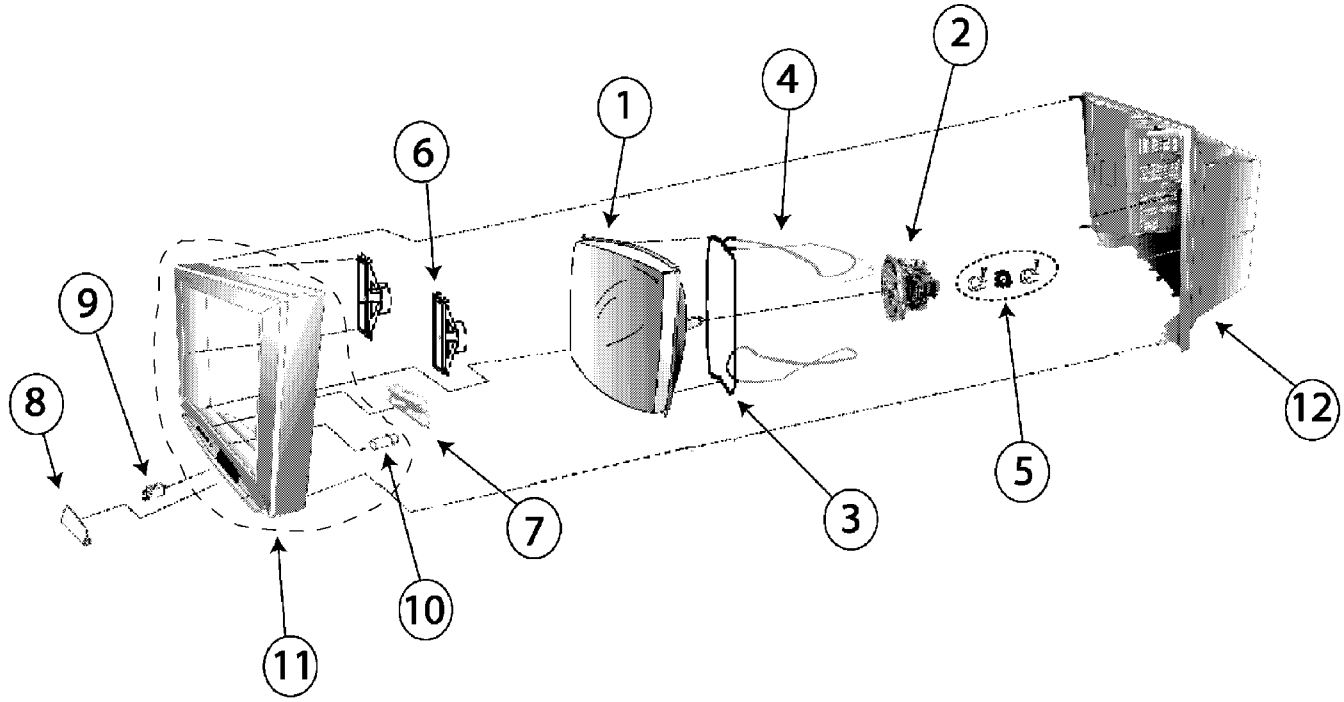
| | Q951 | Q952 | Q953 | Q954 | Q955 |
|---|---|---|---|---|---|
| B | 1.90 | 1.50 | 6.30 | 5.10 | 122.70 |
| C | 8.90 | 5.70 | 8.90 | 0.00 | 105.30 |
| E | 1.50 | 1.50 | 5.70 | 5.60 | 121.90 |

| | Q956 | Q957 | Q958 | Q961 | Q962 |
|---|---|---|---|---|---|
| B | 0.80 | 5.80 | 5.70 | 0.30 | 2.40 |
| C | 65.20 | 0.00 | 8.90 | 1.80 | 8.90 |
| E | 0.30 | 6.30 | 5.10 | 0.00 | 1.90 |

## 18.16. Waveforms



# 19 Parts location



# 20 Parts list

## 20.1. Parts list notes

**Important Safety Notice**

Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use manufacturer's specified parts.

### Abbreviation of part name and description

**1. Resistor**

Example :

ERD25TJ104 **C** 100KΩ, **J**, 1/4W
Type Allowance

| Type | Allowance |
|---|---|
| C : Carbon | F : ± 1% |
| F : Fuse | G : ± 2% |
| M : Metal Oxide<br>Metal Film | J : ± 5%<br>K : ± 10% |
| S : Solid | M : ± 20% |
| W : Wire Wound | |

**2. Capacitor**

Example :

ECKF1H103ZF **C** 0.01μF, **Z**, 50V
Type Allowance

| Type | Allowance |
|---|---|
| C : Carbon | C : ± 0.25pF |
| E : Electrolytic | D : ± 0.5pF |
| P : Polyester<br>Polypropylene | F : ± 1pF<br>G : ± 3% |
| T : Tantalum | J : ± 5% |
| | K : ± 10% |
| | L : ± 15% |
| | M : ± 20% |
| | P : ± 100%, -0% |
| | Z : ± 80%, -20% |

# 20.2. Parts list

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| | | CAPRISTORS | |
| CRA801 | TP00842-51 | TAPING GAP TERMINAL | ⚠ |
| | | CAPACITORS | |
| C003 | ECA1HM4R7B | CAP E 4.7UF-50V | |
| C004 | TCJ2VC1H150J | CAP C 15PF-J-50V | |
| C005 | TCJ2VC1H150J | CAP C 15PF-J-50V | |
| C008 | TCJ2VF1H103Z | CAP C .01UF-Z-50V | |
| C009 | ECJ2VB1C104K | CAP C .1UF-K-16V | |
| C010 | TCJ2VC1H680J | CAP C 68PF-J-50V | |
| C011 | TCJ2VC1H680J | CAP C 68PF-J-50V | |
| C012 | ECA1HM0R1B | CAP E 0.1UF/50V | |
| C013 | TCJ2VC1H680J | CAP C 68PF-J-50V | |
| C016 | ECA1AM101B | CAP E 100UF-10V | |
| C017 | TCJ2VC1H680J | CAP C 68PF-J-50V | |
| C018 | TCJ2VF1H103Z | CAP C .01UF-Z-50V | |
| C019 | ECA0JM102B | CAP E 1000UF-6.3V | |
| C020 | ECA1CM102B | CAP E 1000UF/16V | |
| C021 | TCJ2VF1H103Z | CAP C .01UF-Z-50V | |
| C031 | TCJ2VC1H220J | CAP C 22PF-J-50V | |
| C032 | ECA1AM470B | CAP E 47UF-10V | |
| C034 | TCJ2VC1H390J | CAP C 39PF-J-50V | |
| C035 | TCJ2VC1H120J | CAP C 12PF-J-50V | |
| C038 | ECA1CM470B | CAP E 47UF/16V | |
| C039 | TCJ2VB1H221K | CAP C 220PF-K-50V | |
| C041 | ECA1HM2R2B | CAP E 2.2UF-50V | |
| C043 | ECJ2VF1C105Z | CAP C 1.0UF-Z-16V | |
| C044 | ECA0JM102B | CAP E 1000UF-6.3V | |
| C046 | TCJ2VF1H103Z | CAP C .01UF-Z-50V | |
| C048 | ECJ2VF1C105Z | CAP C 1.0UF-Z-16V | |
| C051 | ECJ2VF1C105Z | CAP C 1.0UF-Z-16V | |
| C052 | ECA1CM101B | CAP E 100UF/16V | |
| C053 | ECJ2VF1C105Z | CAP C 1.0UF-Z-16V | |
| C054 | ECJ2VF1C105Z | CAP C 1.0UF-Z-16V | |
| C055 | ECJ2VF1C105Z | CAP C 1.0UF-Z-16V | |
| C056 | ECJ2VF1C105Z | CAP C 1.0UF-Z-16V | |
| C057 | ECEA1CN100UB | CAP E 10UF-16V | |
| C058 | ECEA1CN100UB | CAP E 10UF-16V | |
| C059 | ECJ2VF1C105Z | CAP C 1.0UF-Z-16V | |
| C060 | ECEA1CN220UB | CAP E 22UF-16V | |
| C061 | ECA1HM100B | CAP E 10UF/50V | |
| C062 | ECA1HM100B | CAP E 10UF/50V | |
| C063 | ECJ2VF1C104Z | CAP C .1UF-Z-16V | |
| C064 | ECA1CM101B | CAP E 100UF/16V | |
| C066 | TCJ2VC1H330J | CAP C 33PF-J-50V | |
| C067 | TCJ2VC1H680J | CAP C 68PF-J-50V | |
| C068 | ECA1CM100B | CAP E 10UF-16V | |
| C070 | ECJ2VF1C104Z | CAP C .1UF-Z-16V | |
| C071 | TCJ2VF1H103Z | CAP C .01UF-Z-50V | |
| C072 | TCJ2VB1H221K | CAP C 220PF-K-50V | |
| C073 | TCJ2VC1H101J | CAP C 100PF-J-50V | |
| C077 | ECA1HM100B | CAP E 10UF/50V | |
| C079 | TCJ2VC1H220J | CAP C 22PF-J-50V | |
| C083 | TCJ2VF1H103Z | CAP C .01UF-Z-50V | |
| C085 | ECJ2VB1C104K | CAP C .1UF-K-16V | |
| C130 | ECWF2684JSR | CAP M .26UF-J-200V<br>CT-24SL13G CT-24SL13UG | ⚠ |
| C131 | ECQE2474KFW | CAP P .47UF-K-200V<br>CT-24SL13G CT-24SL13UG | |
| C132 | ECWF2754JBB | CAP M .27UF-J-200V<br>CT-24SL13G CT-24SL13UG | ⚠ |
| C133 | ECWF2684JSR | CAP M .26UF-J-200V<br>CT-24SL13G CT-24SL13UG | |
| C350 | ECA1CM101B | CAP E 100UF/16V<br>CT-20SL13G | |
| C351 | TACCV470T50V | CAP C 47PF/50V<br>CT-24SL13G CT-24SL13UG | |
| C351 | TCJ2VB1H151K | CAP C 150PF-K-50V<br>CT-20SL13G | |
| C352 | TACCV330T50V | CAP C 33PF/50V<br>CT-24SL13G CT-24SL13UG | |
| C352 | TCJ2VB1H151K | CAP C 150PF-K-50V<br>CT-20SL13G | |
| C353 | TACCV330T50V | CAP C 33PF/50V<br>CT-24SL13G CT-24SL13UG | |
| C353 | TCJ2VB1H151K | CAP C 150PF-K-50V<br>CT-20SL13G | |
| C354 | ECKW3D102KBN | CAP C .001UF-K-2KVDC<br>CT-20SL13G | |
| C357 | EEANA1E1R0B | CAP E 1.0UF-25V<br>CT-20SL13G | |
| C359 | ECA1CM471B | CAP E 470UF-16V | |
| C359 | ECQM4104KZB | CAP P .10UF-K-400V<br>CT-24SL13G CT-24SL13UG | |
| C360 | ECA1HM4R7B | CAP E 4.7UF-50V | |
| C368 | ECQV1H224JL3 | CAP P .22UF-J-50V<br>CT-24SL13G CT-24SL13UG | |
| C370 | ECKW3D102KBN | CAP C .001UF-K-2KVDC<br>CT-24SL13G CT-24SL13UG | |
| C371 | ECEA1HN010UB | CAP E 1UF/50V<br>CT-24SL13G CT-24SL13UG | |
| C373 | ECA2EM470E | CAP E 47UF-250V<br>CT-24SL13G CT-24SL13UG | |
| C403 | ECEA1CN220UB | CAP E 22UF-16V | |
| C411 | ECQB1H683JF3 | CAP P .068UF-J-50V | |
| C451 | ECA1HM2R2B | CAP E 2.2UF-50V | |
| C452 | ECA1CM220B | CAP E 22UF-16V | |
| C454 | ECA1VHG101B | CAP E 100UF-35V | |
| C455 | ECA1EM102E | CAP E 1000UF-25V | |
| C458 | ECA1HM010B | CAP E 1UF-50V | |
| C459 | ECA1VHG471E | CAP E 470UF-35V | |
| C460 | ECQB1224KF3 | CAP P .22UF-K-100V | |
| C461 | ECQB1104JF3 | CAP P .10UF-J-100V | |
| C462 | ECJ2VF1H103Z | CAP C .01UF-Z-50V<br>CT-20SL13G | |
| C462 | TCJ2VF1H103Z | CAP C .01UF-Z-50V<br>CT-24SL13G CT-24SL13UG | |
| C501 | ECCR1H221JC5 | CAP C 220PF-J-50V | |
| C505 | ECQB1H104JF3 | CAP P .10UF-J-50V | |
| C506 | ECKR2H102KB5 | CAP C 1000PF-K-500V | |
| C510 | ECCR2H100D5 | CAP C 10PF-D-500V | |
| C512 | ECA2CM100B | CAP E 10UF-160V<br>CT-20SL13G | |
| C512 | ECA2CM100M | CAP E 10UF-160V<br>CT-24SL13G CT-24SL13UG | |
| C531 | ECA1HM4R7B | CAP E 4.7UF-50V | ⚠ |
| C540 | TCJ2VF1H103Z | CAP C .01UF-Z-50V | |
| C551 | ECA1VHG471B | CAP E 470UF-35V | ⚠ |
| C554 | ECKR2H561KB5 | CAP C 560PF-K-500V | |
| C555 | ECA2EM220E | CAP E 22UF-250V | ⚠ |
| C556 | ECA1CM471B | CAP E 470UF-16V | ⚠ |
| C557 | ECKR2H102KB5 | CAP C 1000PF-K-500V<br>CT-24SL13G CT-24SL13UG | |
| C557 | ECKR2H222KB5 | CAP C 2200PF-K-500V<br>CT-20SL13G | |
| C560 | ECQB1104JFW | CAP P .10UF-J-1KV | |
| C561 | ECEA1HN010UB | CAP E 1UF/50V | |
| C562 | ECKR2H561KB5 | CAP C 560PF-K-500V | |
| C563 | ECWH20113JVB | CAP P .011UF-J-200V<br>CT-24SL13G CT-24SL13UG | |
| C563 | ECWH20752JVB | CAP P 7500PF-J-200V<br>CT-20SL13G | ⚠ |
| C564 | ECKW3D102JBR | CAP C 1000PF-J-2KV<br>CT-20SL13G | ⚠ |
| C564 | ECWH20362JVB | CAP P 3600PF-J-200V<br>CT-24SL13G CT-24SL13UG | ⚠ |
| C565 | ECKW3D471JBR | CAP C 470PF-J-2KV<br>CT-20SL13G | ⚠ |
| C565 | ECKW3D681JBP | CAP C 680PF-J-2KV<br>CT-24SL13G CT-24SL13UG | |
| C566 | ECKW3D181JBP | CAP C 180PF-J-2KV | ⚠ |
| C568 | ECQM4183JZW | CAP P .018UF-J-2KV<br>CT-24SL13G CT-24SL13UG | ⚠ |
| C568 | ECQM4333JZW | CAP P .033UF-J-400V<br>CT-20SL13G | ⚠ |
| C569 | ECWF2304JSR | CAP P .30UF-J-200V<br>CT-20SL13G | |
| C570 | ECA1CM221B | CAP E 10UF-16V | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| C571 | ECA1CM220B | CAP E 22UF-16V | |
| C572 | ECA0JM221B | CAP E 220UF-6.3V | |
| C573 | ECA1CM101B | CAP E 100UF/16V | |
| C575 | ECKR2H471KB5 | CAP C 470PF-K-500V | |
| C593 | ECA1CM470B | CAP E 47UF/16V | |
| C605 | TCJ2VF1H103Z | CAP C .01UF-Z-50V | |
| C606 | ECA0JM221B | CAP E 220UF-6.3V | |
| C756 | ECKW2H682KB5 | CAP C 6800PF-K-500V<br>CT-24SL13G CT-24SL13UG | |
| C759 | ECQE1395KNB | CAP P 3.95UF-K-100V<br>CT-24SL13G CT-24SL13UG | ⚠ |
| C760 | ECA2CM330E | CAP E 33UF-160V<br>CT-24SL13G CT-24SL13UG | ⚠ |
| C763 | ECKR3A121KBP | CAP C 120PF-K-1KV<br>CT-24SL13G CT-24SL13UG | |
| C800 | ECKR3A152KBP | CAP C 1500PF-K-1KVDC | |
| C801 | ECKWAE472ZED | CAP C 4700PF-Z-500V | ⚠ |
| C802 | ECKWAE472ZED | CAP C 4700PF-Z-500V | ⚠ |
| C803 | ECKWAE472ZED | CAP C 4700PF-Z-500V | ⚠ |
| C805 | EC0S2DA221BB | CAP E 220UF/200V<br>CT-20SL13G | ⚠ |
| C805 | EC0S2DA471BB | CAP E 470UF/160V<br>CT-24SL13G CT-24SL13UG | ⚠ |
| C806 | ECQM4103KZW | CAP P .01UF-K-400V | |
| C808 | ECA1HM470B | CAP E 47UF-50V | |
| C809 | ECKR1H102KB5 | CAP C .001UF-K-50V | |
| C810 | ECKR1H471KB5 | CAP C 470PF-K-50V | |
| C812 | ECQU2A224MVA | CAP P .22UF-M-250VAC | ⚠ |
| C813 | ECQU2A153MVA | CAP P .015UF-M-250VAC | ⚠ |
| C814 | ECQU2A153MVA | CAP P .015UF-M-250VAC | ⚠ |
| C820 | ECA1CM101B | CAP E 100UF/16V | |
| C821 | TCJ2VF1H103Z | CAP C .01UF-Z-50V | |
| C822 | ECKR3A221KBP | CAP C 220PF-K-1KV | |
| C823 | ECA1VM471E | CAP E 470UF-35V | ⚠ |
| C824 | ECKR3A102KBP | CAP C 1000PF-K-1KV | |
| C825 | EEUMG2C221S | CAP E 220UF-160V | ⚠ |
| C826 | ECKR3A471KBP | CAP C 470PF-K-1KV | |
| C827 | ECA1CM102B | CAP E 1000UF/16V | |
| C828 | ECA160V33UE | CAP E 33UF/160V | ⚠ |
| C829 | ECA1CM471B | CAP E 470UF-16V | |
| C830 | ECA1CM471B | CAP E 470UF-16V | |
| C901 | ECJ2VB1H103K | CAP C .01UF-K-50V<br>CT-24SL13G CT-24SL13UG | |
| C904 | ECKR1H103ZF5 | CAP C .01UF-Z-50V<br>CT-24SL13G CT-24SL13UG | |
| C952 | ECA1HM100B | CAP E 10UF/50V<br>CT-24SL13G CT-24SL13UG | |
| C953 | ECKR1H103ZF5 | CAP C .01UF-Z-50V<br>CT-24SL13G CT-24SL13UG | |
| C958 | ECA2CM470E | CAP E 47UF-160V<br>CT-24SL13G CT-24SL13UG | |
| C959 | ECKW2H103ZF7 | CAP C .01UF-Z-500V<br>CT-24SL13G CT-24SL13UG | |
| C960 | ECCR2H151J5 | CAP C 150-500V<br>CT-24SL13G CT-24SL13UG | |
| C961 | ECA2AM100B | CAP E 10UF-100V<br>CT-24SL13G CT-24SL13UG | |
| C962 | ECKW2H103ZF7 | CAP C .01UF-Z-500V<br>CT-24SL13G CT-24SL13UG | |
| C963 | ECCR1H151J5 | CAP DISC 150-5-50V<br>CT-24SL13G CT-24SL13UG | |
| C964 | ECA1CHG101B | CAP E 100UF-16V<br>CT-24SL13G CT-24SL13UG | |
| C966 | ECA1CHG101B | CAP E 100UF-16V<br>CT-24SL13G CT-24SL13UG | |
| C967 | ECA1CM221B | CAP E 10UF-16V<br>CT-24SL13G CT-24SL13UG | |
| C968 | ECKR1H103ZF5 | CAP C .01UF-Z-50V<br>CT-24SL13G CT-24SL13UG | |
| C969 | ECKR1H103ZF5 | CAP C .01UF-Z-50V<br>CT-24SL13G CT-24SL13UG | |
| C971 | TACCW222T50V | CAP C 2200PF/50V<br>CT-24SL13G CT-24SL13UG | |
| C2201 | ECA1HM4R7B | CAP E 4.7UF-50V | |
| C2202 | ECA1HM2R2B | CAP E 2.2UF-50V | |
| C2203 | ECA1HM4R7B | CAP E 4.7UF-50V | |
| C2204 | AP106K016CAE | CAP T 10UF/16V | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| C2205 | ECA1HMR33B | CAP E .33UF-50V | |
| C2206 | ECQB1H223JF3 | CAP P .022UF-J-50V | |
| C2207 | AP335K016CAE | CAP T 3.3UF/16V | |
| C2208 | ECJ2VB1C104K | CAP C .1UF-K-16V | |
| C2209 | ECJ2VB1C104K | CAP C .1UF-K-16V | |
| C2210 | ECJ2VB1C104K | CAP C .1UF-K-16V | |
| C2212 | ECQB1H473JF3 | CAP P .047UF-J-50V | |
| C2213 | ECA1HMR47B | CAP E .47UF-50V | |
| C2214 | ECA1AM101B | CAP E 100UF-10V | |
| C2215 | EEANA1E100B | CAP E 10UF-25V | |
| C2216 | TCJ2VC1H100D | CAP C 10PF-J-50V | |
| C2217 | ECJ2VB1H102K | CAP C .001UF-K-50V | |
| C2217 | TCJ2VB1H102K | CAP C 1000PF-K-50V | |
| C2218 | ECJ2VB1H102K | CAP C .001UF-K-50V | |
| C2218 | TCJ2VB1H102K | CAP C 1000PF-K-50V | |
| C2219 | ECJ2VF1C105Z | CAP C 1.0UF-Z-16V | |
| C2220 | ECJ2VF1C105Z | CAP C 1.0UF-Z-16V | |
| C2301 | ECA1EM102E | CAP E 1000UF-25V | |
| C2302 | ECA1HM010B | CAP E 1UF-50V | |
| C2304 | ECA1CM101B | CAP E 100UF/16V | |
| C2307 | ECA1CM102B | CAP E 1000UF/16V | |
| C2308 | ECKR1H103ZF5 | CAP C .01UF-Z-50V | |
| C2309 | ECA1HM010B | CAP E 1UF-50V | |
| C2312 | ECA1HM010B | CAP E 1UF-50V | |
| C2313 | ECA1EM220B | CAP E 22UF-25V | |
| C2317 | ECA1CM102B | CAP E 1000UF/16V | |
| C2319 | ECA1HM010B | CAP E 1UF-50V | |
| C2350 | ECA1CM101B | CAP E 100UF/16V | |
| C2501 | TCJ2VB1H332K | CAP C .0033UF-K-50V | |
| C2502 | TCJ2VB1H332K | CAP C .0033UF-K-50V | |
| C2503 | TCJ2VB1H333K | CAP C .033UF-K-50V | |
| C2504 | TCJ2VB1H333K | CAP C .033UF-K-50V | |
| C2505 | EEANA1E4R7B | CAP E 4.7UF-25V | |
| C2506 | EEANA1E4R7B | CAP E 4.7UF-25V | |
| C2507 | TCJ2VB1H472K | CAP C 4700PF-K-50V | |
| C2508 | TCJ2VB1H472K | CAP C 4700PF-K-50V | |
| C2509 | ECJ2VB1C104K | CAP C .1UF-K-16V | |
| C2510 | ECJ2VB1C104K | CAP C .1UF-K-16V | |
| C2511 | ECA1HM010B | CAP E 1UF-50V | |
| C2512 | ECJ2VB1C104K | CAP C .1UF-K-16V | |
| C2513 | ECA1HM4R7B | CAP E 4.7UF-50V | |
| C2514 | ECA1HM4R7B | CAP E 4.7UF-50V | |
| C2515 | TCJ2VF1C105Z | CAP C 1.0UF-Z-16V | |
| C2516 | ECA1HM4R7B | CAP E 4.7UF-50V | |
| C2517 | ECA1HM4R7B | CAP E 4.7UF-50V | |
| C2518 | ECA1HM4R7B | CAP E 4.7UF-50V | |
| C2519 | ECA1CM220B | CAP E 22UF-16V<br>CT-24SL13G CT-24SL13UG | |
| C2519 | ECA1CM470B | CAP E 47UF/16V<br>CT-20SL13G | |
| C2520 | TCJ2VF1H103Z | CAP C .01UF-Z-50V | |
| C2531 | ECA1HM4R7B | CAP E 4.7UF-50V | |
| C2532 | ECA1HM4R7B | CAP E 4.7UF-50V | |
| C3001 | ECA1CM220B | CAP E 22UF-16V | |
| C3002 | ECA1CM220B | CAP E 22UF-16V | |
| C3011 | ECJ2VF1C105Z | CAP C 1.0UF-Z-16V | |
| C3012 | ECA1HM010B | CAP E 1UF-50V | |
| C3013 | ECA1CM100B | CAP E 10UF-16V | |
| C3014 | ECA1CM100B | CAP E 10UF-16V | |
| C3015 | ECA1HM010B | CAP E 1UF-50V | |
| C3016 | ECA1HM010B | CAP E 1UF-50V | |
| C3017 | ECA1HM010B | CAP E 1UF-50V | |
| C3018 | ECA1HM010B | CAP E 1UF-50V | |
| C3019 | ECJ2VF1C105Z | CAP C 1.0UF-Z-16V | |
| C3020 | ECA1HM010B | CAP E 1UF-50V | |
| C3025 | ECA1HM100B | CAP E 10UF/50V | |
| C3121 | ECA1CM470B | CAP E 47UF/16V | |
| C3122 | TCJ2VF1H103Z | CAP C .01UF-Z-50V | |
| C3234 | ECA1CM470B | CAP E 47UF/16V | |
| C3240 | TCJ2VF1H103Z | CAP C .01UF-Z-50V | |
| C4322 | ECA1CM100B | CAP E 10UF-16V | |
| C4323 | ECA1CM470B | CAP E 47UF/16V | |
| C4324 | TCJ2VF1H103Z | CAP C .01UF-Z-50V | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| C4325 | ECA1CM100B | CAP E 10UF-16V | |
| | | DIODES | |
| D001 | MAZ30680ML | DIODE ZENER | |
| D002 | MA2C165001VT | DIODE | |
| D003 | MAZ30510HL | DIODE | |
| D006 | MAZ33000HL | DIODE | |
| D007 | MAZ30510HL | DIODE | |
| D010 | MAZ40510MF | DIODE ZENER | |
| D055 | MAZ40330MF | DIODE ZENER | |
| D360 | B0HAGP000003 | DIODE<br>CT-24SL13G CT-24SL13UG | |
| D360 | MA2C165001VT | DIODE | |
| D361 | B0HAGP000003 | DIODE<br>CT-24SL13G CT-24SL13UG | |
| D362 | B0HAGP000003 | DIODE<br>CT-24SL13G CT-24SL13UG | |
| D380 | MA2C029WBF | DIODE | |
| D451 | B0EAKL000008 | DIODE RECTIFIER | |
| D452 | MA2C165001VT | DIODE | |
| D505 | D1NL40V70 | DIODE | |
| D531 | MA2C165001VT | DIODE | ⚠ |
| D551 | B0HAMM000072 | DIODE FAST RECOVERY | ⚠ |
| D554 | AU02V0 | DIODE | ⚠ |
| D556 | MA2C165001VT | DIODE | |
| D557 | MA4027LTA | DIODE | |
| D558 | B0HANV000008 | DIODE | |
| D559 | EU2 | DIODE | |
| D561 | AU02V0 | DIODE | ⚠ |
| D606 | MA2C165001VT | DIODE | |
| D753 | AU01ZV0 | DIODE<br>CT-24SL13G CT-24SL13UG | |
| D801 | D3SBA60-4103 | DIODE | ⚠ |
| D803 | MAZ41200MF | DIODE ZENER | |
| D806 | TAP2AA0003 | PTC 3-OHM | ⚠ |
| D808 | SARS01V1 | DIODE | |
| D809 | B0HAJP000015 | DIODE | |
| D810 | B0HAJP000015 | DIODE | |
| D811 | B0HAJP000015 | DIODE | |
| D820 | MA2C165001VT | DIODE | |
| D821 | MAZ40470HF | DIODE ZENER | |
| D822 | B0HAMM000103 | DIODE | |
| D823 | S3L60P154004 | DIODE | ⚠ |
| D824 | B0HAMM000072 | DIODE FAST RECOVERY | |
| D2302 | MAZ43000MF | DIODE ZENER | |
| D2305 | CVS20A120MTA | DIODE | |
| D2307 | CVS20A120MTA | DIODE | |
| D2350 | MAZ40910LF | DIODE ZENER | |
| D2353 | MA2C165001VT | DIODE | |
| D2355 | MAZ30510HL | DIODE | |
| D2360 | CVS20A120MTA | DIODE | |
| D2361 | CVS20A120MTA | DIODE | |
| D2501 | MAZ31100ML | DIODE ZENER | |
| D3001 | MAZ40510MF | DIODE ZENER | |
| D3004 | CVS20A120MTA | DIODE | |
| D3005 | CVS20A120MTA | DIODE | |
| D3007 | MAZ31100ML | DIODE ZENER | |
| D3008 | MAZ31100ML | DIODE ZENER | |
| D3009 | MAZ31100ML | DIODE ZENER | |
| D3010 | MAZ31100ML | DIODE ZENER | |
| D3011 | MAZ31100ML | DIODE ZENER | |
| D3012 | MAZ31100ML | DIODE ZENER | |
| D3017 | MAZ31100ML | DIODE ZENER | |
| D3018 | MAZ31100ML | DIODE ZENER | |
| D3019 | CVS20A120MTA | DIODE | |
| D3021 | CVS20A120MTA | DIODE | |
| D3023 | MAZ31100ML | DIODE ZENER | |
| D3024 | MAZ31100ML | DIODE ZENER | |
| | | FUSES | |
| F801 | XBA2A00101 | FUSE 6.3A 125V | ⚠ |
| | | INTEGRATED CIRCUITS | |
| IC001 | MN101E03GTB5 | MPU | |
| IC002 | TVR2AJ169S | EEPROM<br>CT-24SL13G CT-24SL13UG | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| IC002 | TVR2AJ171S | EEPROM<br>CT-20SL13G | |
| IC003 | GP1UE282GK | IR SENSOR | |
| IC004 | PST9128NR | RESET | |
| IC005 | PQ3RD13 | 3.3V STBY REGULATOR | |
| IC351 | C1AA00000622 | RGB AMPLIFIER<br>CT-24SL13G CT-24SL13UG | |
| IC451 | AN5522 | VERTICAL OUTPUT AMPLIFIER | |
| IC501 | NC7SZU04M5X | H-DRIVE INVERTER | |
| IC551 | AN78M09LB | 9V VOLTAGE REGULATOR | |
| IC552 | AN78M05LB | 5V VOLTAGE REGULATOR | |
| IC801 | STRW5634 | MAIN POWER SUPPLY | ⚠ |
| IC802 | 0N3171RLF | OPTO-COUPLER | ⚠ |
| IC2201 | AN5829S-E1V | MTS | |
| IC2301 | AN17807A | AUDIO AMPLIFIER | |
| IC2501 | NJW1137MTE1 | BBE PROCESSOR | |
| IC3001 | MM1114XFBE | VIDEO SWITCH | |
| IC3002 | MM1501XNRE | FRONT VIDEO SWITCH | |
| IC3101 | 74HC4066D653 | AUDIO SWITCH | |
| | | COILS | |
| L002 | EXCELSA39V | FERRITE BEAD | |
| L003 | EXCELDR35V | FERRITE BEAD | |
| L005 | EXCELSA35V | FERRITE BEAD | |
| L006 | EXCELSA35T | FERRITE BEAD | |
| L007 | ELESN330JA | COIL PEAKING 33UH | |
| L008 | G0C470KA0029 | COIL PEAKING 47UH | |
| L010 | G0C2R2KA0029 | COIL PEAKING 2.2UH | |
| L011 | EXCELSA26T | FERRITE BEAD | |
| L012 | G0C2R2KA0029 | COIL PEAKING 2.2UH | |
| L013 | EXCELSA26T | FERRITE BEAD | |
| L014 | ELESN180KA | COIL PEAKING 18UH | |
| L015 | ELESN3R3JA | COIL PEAKING 3.3UH | |
| L020 | EXCELSA26T | FERRITE BEAD | |
| L032 | EXCELSA26T | FERRITE BEAD | |
| L108 | EXCELSA35V | FERRITE BEAD | |
| L110 | G0C101KA0021 | COIL PEAKING 100UH | |
| L148 | EXCELSA35T | FERRITE BEAD | |
| L245 | EXCELSA35V | FERRITE BEAD | |
| L312 | EXCELSA24T | FERRITE BEAD | |
| L551 | ELH5L4115 | COIL<br>CT-20SL13G | ⚠ |
| L551 | ELH5L6108 | COIL<br>CT-24SL13G CT-24SL13UG | ⚠ |
| L552 | EXCELSA39V | FERRITE BEAD | |
| L600 | ELC18B801E | COIL<br>CT-24SL13G CT-24SL13UG | |
| L601 | ELC18B801E | COIL<br>CT-24SL13G CT-24SL13UG | |
| L602 | TLUADNB682K | COIL<br>CT-24SL13G CT-24SL13UG | |
| L751 | ELC18B301L | COIL CHOKE<br>CT-24SL13G CT-24SL13UG | |
| L752 | TALL13N103JB | COIL<br>CT-24SL13G CT-24SL13UG | |
| L753 | EXCELSA35T | FERRITE BEAD<br>CT-24SL13G CT-24SL13UG | |
| L801 | ELF15N011A | COIL<br>CT-20SL13G | |
| L801 | ELF21V020A | COIL<br>CT-24SL13G CT-24SL13UG | ⚠ |
| L802 | ELEKE680KA | COIL PEAKING 68UH<br>CT-20SL13G | |
| L802 | TALL08T470KA | COIL<br>CT-24SL13G CT-24SL13UG | |
| L803 | TALL08T680KA | COIL | |
| L804 | EXCELDR35V | FERRITE BEAD<br>CT-20SL13G | |
| L805 | EXCELDR35V | FERRITE BEAD<br>CT-20SL13G | |
| L806 | EXCELDR35V | FERRITE BEAD | |
| L807 | EXCELSA35V | FERRITE BEAD | |
| L808 | EXCELSA35V | FERRITE BEAD | |
| L809 | EXCELDR35V | FERRITE BEAD<br>CT-24SL13G CT-24SL13UG | |
| L810 | EXCELDR35V | FERRITE BEAD<br>CT-24SL13G CT-24SL13UG | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| L951 | EXCELSA24T | FERRITE BEAD<br>CT-24SL13G CT-24SL13UG | |
| L953 | EXCELSA24T | FERRITE BEAD<br>CT-24SL13G CT-24SL13UG | |
| L954 | EXCELSA24T | FERRITE BEAD<br>CT-24SL13G CT-24SL13UG | |
| L955 | EXCELSA24T | FERRITE BEAD<br>CT-24SL13G CT-24SL13UG | |
| L2301 | EXCELSA35T | FERRITE BEAD | |
| L2303 | EXCELSA39V | FERRITE BEAD | |
| L2305 | EXCELSA35V | FERRITE BEAD | |
| | | TRANSISTORS | |
| Q001 | 2PD601AR-115 | TRANSISTOR | |
| Q057 | 2PB709AR-115 | TRANSISTOR | |
| Q058 | 2PB709AR-115 | TRANSISTOR | |
| Q070 | 2PD601AR-115 | TRANSISTOR | |
| Q092 | 2PB709AR-115 | TRANSISTOR | |
| Q351 | 2SC3063RL | TRANSISTOR<br>CT-20SL13G | |
| Q352 | 2SC3063RL | TRANSISTOR<br>CT-20SL13G | |
| Q353 | 2SC3063RL | TRANSISTOR<br>CT-20SL13G | |
| Q354 | 2PD601AR-115 | TRANSISTOR | |
| Q355 | 2PD601AR-115 | TRANSISTOR | |
| Q356 | 2PD601AR-115 | TRANSISTOR | |
| Q357 | 2PD601AR-115 | TRANSISTOR | |
| Q358 | 2PD601AR-115 | TRANSISTOR | |
| Q359 | 2PD601AR-115 | TRANSISTOR | |
| Q360 | 2PB709AR-115 | TRANSISTOR | |
| Q361 | 2PB709AR-115 | TRANSISTOR | |
| Q362 | 2PB709AR-115 | TRANSISTOR | |
| Q411 | 2SB0710AQL | TRANSISTOR | |
| Q412 | 2SD0602AQL | TRANSISTOR | |
| Q451 | 2PB709AR-115 | TRANSISTOR | |
| Q451 | 2SB709ARTX | TRANSISTOR<br>CT-20SL13G | |
| Q501 | 2SC1573AH | TRANSISTOR<br>CT-20SL13G | |
| Q501 | 2SC4212HLB | TRANSISTOR<br>CT-24SL13G CT-24SL13UG | |
| Q551 | 2SC562200VLK | TRANSISTOR<br>CT-20SL13G | |
| Q551 | 2SC5902000LK | TRANSISTOR<br>CT-24SL13G CT-24SL13UG | ⚠ |
| Q560 | 2PB709AR-115 | TRANSISTOR | |
| Q605 | 2PB709AR-115 | TRANSISTOR | |
| Q606 | 2PD601AR-115 | TRANSISTOR | |
| Q751 | B1DACM000001 | TRANSISTOR<br>CT-24SL13G CT-24SL13UG | |
| Q757 | 2SC1685QRSTA | TRANSISTOR<br>CT-24SL13G CT-24SL13UG | |
| Q801 | 2PD601AR-115 | TRANSISTOR | |
| Q802 | 2PD601AR-115 | TRANSISTOR | |
| Q820 | 2SA1767QTA | TRANSISTOR | |
| Q830 | 2SB1011QRL | TRANSISTOR | |
| Q831 | 2SC1473ATA | TRANSISTOR | |
| Q901 | 2PD601AR-115 | TRANSISTOR<br>CT-24SL13G CT-24SL13UG | |
| Q902 | 2PB709AR-115 | TRANSISTOR<br>CT-24SL13G CT-24SL13UG | |
| Q951 | 2SC3311ATA | TRANSISTOR<br>CT-24SL13G CT-24SL13UG | |
| Q952 | 2SC3311ATA | TRANSISTOR<br>CT-24SL13G CT-24SL13UG | |
| Q953 | 2SC1741ASTP | TRANSISTOR<br>CT-24SL13G CT-24SL13UG | |
| Q954 | 2SB1030ATA | TRANSISTOR<br>CT-24SL13G CT-24SL13UG | |
| Q955 | 2SB1569AF51E | TRANSISTOR<br>CT-24SL13G CT-24SL13UG | |
| Q956 | 2SD2400AF51E | TRANSISTOR<br>CT-24SL13G CT-24SL13UG | |
| Q957 | 2SA1309ATA | TRANSISTOR<br>CT-24SL13G CT-24SL13UG | |
| Q958 | 2SC3311ATA | TRANSISTOR<br>CT-24SL13G CT-24SL13UG | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| Q961 | 2SC3311ATA | TRANSISTOR<br>CT-24SL13G CT-24SL13UG | |
| Q962 | 2SC3311ATA | TRANSISTOR<br>CT-24SL13G CT-24SL13UG | |
| Q2350 | 2PB709AR-115 | TRANSISTOR | |
| Q2361 | 2PD601AR-115 | TRANSISTOR | |
| Q2362 | 2PD601AR-115 | TRANSISTOR | |
| Q2363 | 2PB709AR-115 | TRANSISTOR | |
| Q3001 | 2PD601AR-115 | TRANSISTOR | |
| Q3002 | 2PD601AR-115 | TRANSISTOR | |
| Q3193 | 2PD601AR-115 | TRANSISTOR | |
| Q3194 | 2PD601AR-115 | TRANSISTOR | |
| | | RELAYS | |
| RL801 | K6B1AGA00042 | RELAY | ⚠ |
| | | RESISTORS | |
| R001 | ERJ6GEYJ103V | RES M 10K-J-1/10W | |
| R004 | ERJ6GEYJ562V | RES M 5.6K-J-1/10W | |
| R005 | ERJ6GEYJ471V | RES M 470-J-1/10W | |
| R007 | ERJ6GEYJ471V | RES M 470-J-1/10W | |
| R008 | ERJ6GEYJ223V | RES M 22K-J-1/10W | |
| R009 | ERJ6GEYJ102V | RES M 1K-J-1/10W | |
| R014 | ERJ6GEYJ472V | RES M 4.7K-J-1/10W | |
| R015 | ERJ6GEYJ472V | RES M 4.7K-J-1/10W | |
| R016 | ERJ6GEYJ221V | RES M 220-J-1/10W | |
| R017 | ERJ6GEYJ221V | RES M 220-J-1/10W | |
| R018 | ERJ6GEYJ472V | RES M 4.7K-J-1/10W | |
| R019 | ERJ6GEYJ472V | RES M 4.7K-J-1/10W | |
| R020 | ERJ6GEYJ221V | RES M 220-J-1/10W | |
| R021 | ERJ6GEYJ101V | RES M 100-J-1/10W | |
| R022 | ERJ6GEYJ101V | RES M 100-J-1/10W | |
| R023 | ERJ6GEYJ102V | RES M 1K-J-1/10W | |
| R024 | ERJ6GEYJ101V | RES M 100-J-1/10W | |
| R025 | ERJ6GEYJ101V | RES M 100-J-1/10W | |
| R026 | ERDS1FJ561P | RES C 560-J-1/2W | |
| R032 | ERJ6GEYJ103V | RES M 10K-J-1/10W | |
| R033 | ERJ6GEYJ222V | RES M 2.2K-J-1/10W | |
| R034 | ERJ6GEYJ222V | RES M 2.2K-J-1/10W | |
| R035 | ERJ6GEYJ332V | RES M 3.3K-J-1/10W | |
| R036 | ERJ6GEYJ512V | RES M 5.1K-J-1/10W | |
| R037 | ERJ6GEYJ912V | RES M 9.1K-J-1/10W | |
| R038 | ERJ6GEYJ223V | RES M 22K-J-1/10W | |
| R039 | ERDS2TJ102T | RES C 1K-J-1/4W | |
| R040 | ERJ6GEYJ680V | RES M 68-J-1/10W | |
| R041 | ERJ6GEYJ222V | RES M 2.2K-J-1/10W | |
| R042 | ERJ6GEYJ222V | RES M 2.2K-J-1/10W | |
| R043 | ERJ6GEYJ153V | RES M 15K-J-1/10W | |
| R044 | ERJ6GEYJ101V | RES M 100-J-1/10W | |
| R045 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R046 | ERJ6GEYJ102V | RES M 1K-J-1/10W | |
| R047 | ERJ6GEYJ472V | RES M 4.7K-J-1/10W | |
| R048 | ERJ6GEYJ101V | RES M 100-J-1/10W | |
| R050 | ERJ6GEYJ102V | RES M 1K-J-1/10W | |
| R052 | ERJ6GEYJ103V | RES M 10K-J-1/10W | |
| R053 | ERJ6GEYJ101V | RES M 100-J-1/10W | |
| R055 | ERJ6GEYJ103V | RES M 10K-J-1/10W | |
| R056 | ERJ6GEYJ471V | RES M 470-J-1/10W | |
| R057 | ERJ6GEYJ101V | RES M 100-J-1/10W | |
| R059 | ERJ6GEYJ121V | RES M 120-J-1/10W<br>CT-24SL13G CT-24SL13UG | |
| R060 | ERJ6GEYJ101V | RES M 100-J-1/10W | |
| R061 | ERJ6GEYJ221V | RES M 220-J-1/10W | |
| R062 | ERJ6GEYJ472V | RES M 4.7K-J-1/10W | |
| R063 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R064 | ERJ6GEYJ473V | RES M 47K-J-1/10W | |
| R065 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R066 | ERJ6GEYJ223V | RES M 22K-J-1/10W | |
| R067 | ERJ6GEYJ223V | RES M 22K-J-1/10W | |
| R068 | ERJ6GEYJ103V | RES M 10K-J-1/10W | |
| R069 | ERJ6GEYJ123V | RES M 12K-J-1/10W | |
| R070 | ERJ6GEYJ561V | RES M 560-J-1/10W | |
| R071 | ERJ6GEYJ680V | RES M 68-J-1/10W | |
| R072 | ERJ6GEYJ222V | RES M 2.2K-J-1/10W | |
| R073 | ERJ6GEYJ471V | RES M 470-J-1/10W | |
| R074 | ERJ6GEYJ471V | RES M 470-J-1/10W | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| R075 | ERJ6ENF3902V | RES M 39K-F-1/10W | |
| R076 | ERJ6ENF6201V | RES M 6.2K-F-1/10W | |
| R077 | ERJ6GEYJ103V | RES M 10K-J-1/10W | |
| R078 | ERJ6GEYJ103V | RES M 10K-J-1/10W | |
| R080 | ERJ6GEYJ183V | RES M 18K-J-1/10W | |
| R081 | ERJ6GEYJ153V | RES M 15K-J-1/10W | |
| R082 | ERJ6GEYJ183V | RES M 18K-J-1/10W | |
| R083 | ERJ6GEYJ153V | RES M 15K-J-1/10W | |
| R084 | ERDS2TJ182T | RES C 1.8K-J-1/4W | |
| R087 | ERDS2TJ221T | RES C 220-J-1/4W | |
| R088 | ERJ6GEYJ223V | RES M 22K-J-1/10W | |
| R092 | ERJ6GEYJ473V | RES M 47K-J-1/10W | |
| R093 | ERJ6GEYJ331V | RES M 330-J-1/10W | |
| R150 | ERQ12AJ101P | RES F 100-J-1/2W<br>CT-24SL13G CT-24SL13UG | |
| R202 | ERJ6GEYJ222V | RES M 2.2K-J-1/10W | |
| R327 | ERDS2TJ471T | RES C 470-J-1/4W | |
| R351 | ERG2FJ123H | RES M 12K-J-2W<br>CT-20SL13G | |
| R351 | ER0S2THF9100 | RES M 910-F-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R352 | ERG2FJ123H | RES M 12K-J-2W<br>CT-20SL13G | |
| R352 | ER0S2THF9100 | RES M 910-F-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R353 | ERG2FJ123H | RES M 12K-J-2W<br>CT-20SL13G | |
| R353 | ER0S2THF9100 | RES M 910-F-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R354 | ERC12GK272C | RES C 2.7K-K-1/2W<br>CT-20SL13G | |
| R354 | ERDS2TJ621T | RES C 620-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R355 | ERC12GK272C | RES C 2.7K-K-1/2W<br>CT-20SL13G | |
| R355 | ERDS2TJ621T | RES C 620-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R356 | ERC12GK272C | RES C 2.7K-K-1/2W<br>CT-20SL13G | |
| R356 | ERDS2TJ621T | RES C 620-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R357 | ERDS2TJ102T | RES C 1K-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R357 | ERJ6ENF4300V | RES M 430-F-1/10W<br>CT-20SL13G | |
| R358 | ERDS1TJ124T | RES C 120K-J-1/2W<br>CT-24SL13G CT-24SL13UG | |
| R358 | ERJ6ENF4300V | RES M 430-F-1/10W<br>CT-20SL13G | |
| R359 | ERDS1TJ124T | RES C 120K-J-1/2W<br>CT-24SL13G CT-24SL13UG | |
| R359 | ERJ6ENF4300V | RES M 430-F-1/10W<br>CT-20SL13G | |
| R360 | ERDS1TJ124T | RES C 120K-J-1/2W<br>CT-24SL13G CT-24SL13UG | |
| R360 | ERJ6ENF7500V | RES M 750-F-1/10W<br>CT-20SL13G | |
| R361 | ERJ6ENF7500V | RES M 750-F-1/10W<br>CT-20SL13G | |
| R361 | ER0S2THF8451 | RES M 8.45K-F-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R362 | ERJ6ENF7500V | RES M 750-F-1/10W<br>CT-20SL13G | |
| R362 | ER0S2THF2201 | RES M 2.2K-F-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R363 | ERC12GK102D | RES C 1K-K-1/2W<br>CT-24SL13G CT-24SL13UG | |
| R363 | ERJ6GEYJ101V | RES M 100-J-1/10W<br>CT-20SL13G | |
| R364 | ERC12GK102D | RES C 1K-K-1/2W<br>CT-24SL13G CT-24SL13UG | |
| R364 | ERJ6GEYJ101V | RES M 100-J-1/10W<br>CT-20SL13G | |
| R365 | ERC12GK102D | RES C 1K-K-1/2W<br>CT-24SL13G CT-24SL13UG | |
| R365 | ERJ6GEYJ101V | RES M 100-J-1/10W<br>CT-20SL13G | |
| R371 | ERDS2TJ102T | RES C 1K-J-1/4W<br>CT-24SL13G CT-24SL13UG | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| R371 | ERJ6GEYJ101V | RES M 100-J-1/10W | |
| R372 | ERDS2TJ102T | RES C 1K-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R372 | ERJ6GEYJ101V | RES M 100-J-1/10W | |
| R373 | ERJ6GEYJ101V | RES M 100-J-1/10W | |
| R374 | ERJ6GEYJ102V | RES M 1K-J-1/10W | |
| R374 | ERQ12AJ121P | RES F 120-J-1/2W<br>CT-24SL13G CT-24SL13UG | |
| R375 | ERJ6GEYJ102V | RES M 1K-J-1/10W | |
| R376 | ERJ6GEYJ102V | RES M 1K-J-1/10W | |
| R377 | ERJ6ENF3300V | RES M 330-F-1/10W | |
| R378 | ERJ6ENF3300V | RES M 330-F-1/10W | |
| R379 | ERJ6ENF3300V | RES M 330-F-1/10W | |
| R380 | ERJ6ENF1501V | RES M 1.5K-F-1/10W | |
| R381 | ERJ6ENF1501V | RES M 1.5K-F-1/10W | |
| R382 | ERJ6ENF1501V | RES M 1.5K-F-1/10W | |
| R383 | ERJ6ENF3481V | RES M 3.48K-F-1/10W | |
| R384 | ERJ6ENF7500V | RES M 750-F-1/10W | |
| R385 | ERDS1FJ150P | RES C 15-J-1/2W | |
| R389 | ERJ6GEYJ102V | RES M 1K-J-1/10W | |
| R390 | ERJ6GEYJ102V | RES M 1K-J-1/10W | |
| R391 | ERJ6GEYJ102V | RES M 1K-J-1/10W | |
| R411 | ERJ6GEYJ682V | RES M 6.8K-J-1/10W | |
| R412 | ERJ6GEYJ471V | RES M 470-J-1/10W | |
| R413 | ERJ6GEYJ103V | RES M 10K-J-1/10W | |
| R414 | ERJ6GEYJ471V | RES M 470-J-1/10W | |
| R451 | ERDS1FJ1R0P | RES C 1.0-J-1/2W | |
| R452 | ERDS1FJ1R0P | RES C 1.0-J-1/2W | |
| R453 | ERJ6GEYJ113V | RES M 11K-J-1/10W<br>CT-20SL13G | |
| R453 | ERJ6GEYJ333V | RES M 33K-J-1/10W<br>CT-24SL13G CT-24SL13UG | |
| R454 | ERJ6GEYJ363V | RES M 36K-J-1/10W<br>CT-24SL13G CT-24SL13UG | |
| R454 | ERJ6GEYJ513V | RES M 51K-J-1/10W<br>CT-20SL13G | |
| R455 | ERJ6GEYJ103V | RES M 10K-J-1/10W<br>CT-24SL13G CT-24SL13UG | |
| R455 | ERJ6GEYJ153V | RES M 15K-J-1/10W<br>CT-20SL13G | |
| R456 | ERG3FJ151 | RES M 150-J-3W | |
| R457 | ERDS1FJ1R0P | RES C 1.0-J-1/2W | |
| R458 | ERJ6GEYJ123V | RES M 12K-J-1/10W | |
| R459 | ERJ6GEYJ152V | RES M 1.5K-J-1/10W | |
| R462 | ERJ6GEYJ472V | RES M 4.7K-J-1/10W | |
| R463 | ERJ6GEYJ473V | RES M 47K-J-1/10W | |
| R464 | ERJ6GEYJ103V | RES M 10K-J-1/10W | |
| R468 | ERJ6ENF1962V | RES M 19.6K-F-1/10W | |
| R469 | ERJ6ENF5621V | RES M 5.62K-F-1/10W | |
| R471 | ERJ6GEYJ333V | RES M 33K-J-1/10W<br>CT-20SL13G | |
| R471 | ERJ6GEYJ363V | RES M 36K-J-1/10W<br>CT-24SL13G CT-24SL13UG | |
| R504 | ERDS2TJ102T | RES C 1K-J-1/4W | |
| R505 | ERJ6GEYJ562V | RES M 5.6K-J-1/10W | |
| R506 | ERG1SJ562P | RES M 5.6K-J-1W | |
| R507 | ER0S2THF1802 | RES M 18K-F-1/4W | ⚠ |
| R509 | ERJ6ENF1002V | RES M 10K-F-1/10W | ⚠ |
| R510 | ERG3FJ272 | RES M 2.7K-J-3W<br>CT-20SL13G | |
| R510 | ERG3FJ332 | RES M 3.3K-J-3W<br>CT-20SL13G | ⚠ |
| R510 | ERG3FJ622 | RES M 6.2K-J-3W<br>CT-24SL13G CT-24SL13UG | ⚠ |
| R511 | ERG3FJ622 | RES M 6.2K-J-3W<br>CT-24SL13G CT-24SL13UG | ⚠ |
| R512 | ERJ6GEYJ222V | RES M 2.2K-J-1/10W | |
| R514 | ERJ6GEYJ392V | RES M 3.9K-J-1/10W | |
| R515 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R532 | ERJ6ENF2202V | RES M 22K-F-1/10W | ⚠ |
| R533 | ERJ6ENF1003V | RES M 100K-F-1/10W | ⚠ |
| R540 | ERJ6GEYJ105V | RES M 1M-J-1/10W | |
| R541 | ERDS2TJ274T | RES C 27K-J-1/4W | |
| R542 | ERJ6GEYJ124V | RES M 120K-J-1/10W | |
| R547 | ERQ1CJPR82S | RES F .82-J-1W<br>CT-24SL13G CT-24SL13UG | ⚠ |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| R551 | ERX12SJR47P | RES M .47-J-1/2W | ⚠ |
| R552 | ERDS1FJ1R0T | RES C 1.0-J-1/2W | ⚠ |
| R557 | ERJ6GEYJ103V | RES M 10K-J-1/10W | |
| R559 | ERG2FJ683H | RES M 12K-J-2W | |
| R561 | ERG2FJ102H | RES M 1K-J-2W | |
| R562 | ERG2FJ270H | RES M 27-J-2W | |
| R563 | ERG3FJ150H | RES M 15-J-3W | |
| R564 | ERDS2TJ563T | RES C 56K-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R564 | ERDS2TJ823T | RES C 82K-J-1/4W<br>CT-20SL13G | |
| R565 | ERDS2TJ683T | RES C 68K-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R565 | ERDS2TJ823T | RES C 82K-J-1/4W<br>CT-20SL13G | |
| R592 | ERJ6GEYJ472V | RES M 4.7K-J-1/10W | |
| R605 | ERDS2TJ103T | RES C 10K-J-1/4W | |
| R606 | ERJ6GEYJ562V | RES M 5.6K-J-1/10W | |
| R607 | ERJ6GEYJ102V | RES M 1K-J-1/10W | |
| R608 | ERJ6GEYJ104V | RES M 100K-J-1/10W | |
| R713 | ERDS2TJ123T | RES C 12K-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R716 | ERDS2TJ101T | RES C 100-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R756 | ERG2FJ820H | RES M 82-J-2W<br>CT-24SL13G CT-24SL13UG | |
| R761 | ERDS2TJ102T | RES C 1K-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R762 | ERDS2TJ472T | RES C 4.7K-J-1/4<br>CT-24SL13G CT-24SL13UG | |
| R801 | ERF7ZK1R5 | RES W 1.5-K-7W<br>CT-24SL13G CT-24SL13UG | ⚠ |
| R802 | ERG2FJ104H | RES M 100K-J-2W | |
| R804 | ERG1DJ224P | RES M 220K-J-1W | |
| R805 | ERX2FZJR15H | RES M .18-J-2W | ⚠ |
| R806 | ERX12SJ1R5P | RES M 1.5-J-1/2W | ⚠ |
| R807 | ERDS2TJ681T | RES C 680-J-1/4W | |
| R808 | ERX12SJ1R5P | RES M 1.5-J-1/2W | |
| R809 | ERDS2TJ472T | RES C 4.7K-J-1/4 | |
| R810 | ERDS2TJ221T | RES C 220-J-1/4W | |
| R815 | ERC12ZGK825D | RES C 8.2MEG-K-1/2W | ⚠ |
| R817 | ERX3SJ6R8H | RES M 6.8-J-3W<br>CT-20SL13G | ⚠ |
| R821 | ERDS1FJ1R0T | RES C 1.0-J-1/2W<br>CT-24SL13G CT-24SL13UG | |
| R821 | ERDS1FJ1R5T | RES C 1.5-J-1/2W<br>CT-20SL13G | |
| R822 | ERDS1FJ1R0T | RES C 1.0-J-1/2W<br>CT-24SL13G CT-24SL13UG | |
| R822 | ERDS1FJ1R5T | RES C 1.5-J-1/2W<br>CT-20SL13G | |
| R823 | ERDS1FJ272T | RES C 2.7K-J-1/2W | |
| R824 | ERDS2TJ223T | RES C 22K-J-1/4W | |
| R825 | ERDS2TJ272T | RES C 2.7K-J-1/4W | |
| R827 | ERJ6GEYJ153V | RES M 15K-J-1/10W | |
| R828 | ERJ6GEYJ104V | RES M 100K-J-1/10W | |
| R829 | ERJ6GEYJ104V | RES M 100K-J-1/10W | |
| R830 | ERG2FJ273H | RES M 27K-J-2W | |
| R831 | ERDS2TJ682T | RES C 6.8K-J-1/4W | |
| R832 | ERJ6GEYJ122V | RES M 1.2K-J-1/10W | |
| R833 | ERJ6GEYJ473V | RES M 47K-J-1/10W | |
| R834 | ERJ6GEYJ472V | RES M 4.7K-J-1/10W | |
| R837 | ERJ6GEYJ103V | RES M 10K-J-1/10W | |
| R838 | ERJ6GEYJ103V | RES M 10K-J-1/10W | |
| R851 | ERQ12HJR56P | RES F .56-J-1/2W | ⚠ |
| R902 | ERJ6GEYJ392V | RES M 3.9K-J-1/10W<br>CT-24SL13G CT-24SL13UG | |
| R903 | ERJ6GEYJ561V | RES M 560-J-1/10W<br>CT-24SL13G CT-24SL13UG | |
| R905 | ERJ6GEYJ102V | RES M 1K-J-1/10W<br>CT-24SL13G CT-24SL13UG | |
| R906 | ERJ6GEYJ102V | RES M 1K-J-1/10W<br>CT-24SL13G CT-24SL13UG | |
| R908 | ERJ6GEYJ683V | RES M 68K-J-1/10W<br>CT-24SL13G CT-24SL13UG | |
| R909 | ERJ6GEYJ103V | RES M 10K-J-1/10W<br>CT-24SL13G CT-24SL13UG | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| R951 | ERDS2TJ821T | RES C 820-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R952 | ERDS2TJ153T | RES C 15K-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R953 | ERDS2TJ332T | RES C 3.3K-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R954 | ERDS2TJ431T | RES C 430-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R956 | ERDS2TJ121T | RES C 120-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R958 | ERDS2TJ391T | RES C 390-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R959 | ERDS2TJ101T | RES C 100-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R960 | ERQ14AJ100E | RES F 10-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R961 | ERQ1CJP331S | RES F 330-J-1W<br>CT-24SL13G CT-24SL13UG | |
| R962 | ERDS2TJ330T | RES C 33-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R963 | ERDS2TJ330T | RES C 33-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R964 | ERDS2TJ471T | RES C 470-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R965 | ERDS2TJ563T | RES C 56K-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R966 | ERDS1FVJ471T | RES C 470-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R967 | ERDS2TJ563T | RES C 56K-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R968 | ERDS2TJ471T | RES C 470-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R969 | ERDS2TJ390T | RES C 39-J-1/2W<br>CT-24SL13G CT-24SL13UG | |
| R970 | ERDS2TJ2R2T | RES C 2.2-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R971 | ERDS2TJ2R2T | RES C 2.2-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R972 | ERDS2TJ390T | RES C 39-J-1/2W<br>CT-24SL13G CT-24SL13UG | |
| R973 | ERDS2TJ101T | RES C 100-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R974 | ERDS2TJ333T | RES C 33K-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R975 | ERDS2TJ101T | RES C 100-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R976 | ERDS2TJ101T | RES C 100-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R977 | ERDS2TJ561T | RES C 560-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R978 | ERDS2TJ101T | RES C 100-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R987 | ERDS2TJ472T | RES C 4.7K-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R988 | ERDS2TJ331T | RES C 330-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R989 | ERDS2TJ682T | RES C 6.8K-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R990 | ERDS2TJ471T | RES C 470-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R993 | ERDS2TJ471T | RES C 470-J-1/4W<br>CT-24SL13G CT-24SL13UG | |
| R2201 | ERJ6GEYJ224V | RES M 220K-J-1/10W | |
| R2203 | ERJ6GEYJ102V | RES M 1K-J-1/10W | |
| R2204 | ERJ6GEYJ102V | RES M 1K-J-1/10W | |
| R2205 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R2206 | ERDS2TJ273T | RES C 27K-J-1/4W | |
| R2307 | ERDS2TJ222T | RES C 2.2K-J-1/4W | |
| R2320 | ERJ6GEYJ103V | RES M 10K-J-1/10W | |
| R2351 | ERJ6GEYJ751V | RES M 750-J-1/10W | |
| R2352 | ERJ6GEYJ152V | RES M 1.5K-J-1/10W | |
| R2356 | ERJ6GEYJ101V | RES M 100-J-1/10W | |
| R2357 | ERJ6GEYJ472V | RES M 4.7K-J-1/10W | |
| R2360 | ERJ6GEYJ271V | RES M 270-J-1/10W | |
| R2361 | ERJ6GEYJ221V | RES M 220-J-1/10W | |
| R2362 | ERJ6GEYJ221V | RES M 220-J-1/10W | |
| R2363 | ERJ6GEYJ332V | RES M 3.3K-J-1/10W | |
| R2364 | ERJ6ENF1001V | RES M 1K-F-1/10W | |
| R2365 | ERJ6ENF8200V | RES M 820-F-1/10W | |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| R2366 | ERJ6GEYJ331V | RES M 330-J-1/10W | |
| R2367 | ERJ6GEYJ102V | RES M 1K-J-1/10W | |
| R2368 | ERJ6GEYJ102V | RES M 1K-J-1/10W | |
| R2369 | ERJ6GEYJ271V | RES M 270-J-1/10W | |
| R2370 | ERJ6GEYJ222V | RES M 2.2K-J-1/10W | |
| R2417 | ERJ6GEYJ103V | RES M 10K-J-1/10W | |
| R2504 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R2505 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R3001 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R3002 | ERJ6GEYJ221V | RES M 220-J-1/10W | |
| R3003 | ERJ6GEYJ221V | RES M 220-J-1/10W | |
| R3004 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R3005 | ERJ6GEYJ334V | RES M 330K-J-1/10W | |
| R3006 | ERJ6ENF75R0V | RES M 75.0-F-1/10W | |
| R3007 | ERJ6ENF75R0V | RES M 75.0-F-1/10W | |
| R3008 | ERJ6ENF75R0V | RES M 75.0-F-1/10W | |
| R3010 | ERJ6GEYJ334V | RES M 330K-J-1/10W | |
| R3013 | ERJ6ENF75R0V | RES M 75.0-F-1/10W | |
| R3014 | ERJ6ENF75R0V | RES M 75.0-F-1/10W | |
| R3015 | ERJ6ENF75R0V | RES M 75.0-F-1/10W | |
| R3016 | ERDS2TJ181T | RES C 180-J-1/4W | |
| R3017 | ERDS2TJ181T | RES C 180-J-1/4W | |
| R3018 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R3020 | ERJ6GEYJ682V | RES M 6.8K-J-1/10W<br>CT-24SL13G CT-24SL13UG | |
| R3021 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R3022 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R3023 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R3024 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R3025 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R3026 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R3027 | ERDS2TJ101T | RES C 100-J-1/4W | |
| R3030 | ERJ6GEYJ223V | RES M 22K-J-1/10W | |
| R3031 | ERJ6GEYJ223V | RES M 22K-J-1/10W | |
| R3032 | ERJ6GEYJ223V | RES M 22K-J-1/10W | |
| R3033 | ERJ6GEYJ223V | RES M 22K-J-1/10W | |
| R3034 | ERJ6GEYJ471V | RES M 470-J-1/10W | |
| R3035 | ERJ6GEYJ562V | RES M 5.6K-J-1/10W | |
| R3036 | ERJ6GEYJ183V | RES M 18K-J-1/10W | |
| R3037 | ERJ6GEYJ471V | RES M 470-J-1/10W | |
| R3038 | ERJ6GEYJ562V | RES M 5.6K-J-1/10W | |
| R3039 | ERJ6GEYJ183V | RES M 18K-J-1/10W | |
| R3041 | ERJ6GEYJ472V | RES M 4.7K-J-1/10W | |
| R3042 | ERJ6GEYJ472V | RES M 4.7K-J-1/10W | |
| R3101 | ERJ6GEYJ334V | RES M 330K-J-1/10W | |
| R3102 | ERJ6GEYJ334V | RES M 330K-J-1/10W | |
| R3103 | ERJ6GEYJ334V | RES M 330K-J-1/10W | |
| R3104 | ERJ6GEYJ334V | RES M 330K-J-1/10W | |
| R3131 | ERJ6GEYJ223V | RES M 22K-J-1/10W | |
| R3132 | ERJ6GEYJ223V | RES M 22K-J-1/10W | |
| R3133 | ERJ6GEYJ153V | RES M 15K-J-1/10W | |
| R3134 | ERJ6GEYJ333V | RES M 33K-J-1/10W | |
| R3135 | ERJ6GEYJ154V | RES M 150K-J-1/10W | |
| | | SWITCHES | |
| S001 | EVQPF106K | SWITCH | |
| S002 | EVQPF106K | SWITCH | |
| S003 | EVQPF106K | SWITCH | |
| S004 | EVQPF106K | SWITCH | |
| S005 | EVQPF106K | SWITCH | |
| S008 | EVQPF106K | SWITCH | |
| S009 | EVQPF106K | SWITCH | |
| | | TRANSFORMERS | |
| T501 | ETH19Y211AZ | TRANSFORMER<br>CT-24SL13G CT-24SL13UG | |
| T501 | ETH19Y22AY | TRANSFORMER HORIZONTAL DRIVE<br>CT-20SL13G | |
| T551 | KFT3AA341F | FLYBACK TRANSFORMER<br>CT-20SL13G | ⚠ |
| T551 | TLF2AA005 | FLYBACK TRANSFORMER<br>CT-24SL13G CT-24SL13UG | ⚠ |
| T801 | ETS29AS1N5NC | TRANSFORMER<br>CT-20SL13G | ⚠ |
| T801 | ETS35AA6B5NC | TRANSFORMER<br>CT-24SL13G CT-24SL13UG | ⚠ |

| Ref. No. | Part No. | Part Name & Description | Remarks |
|---|---|---|---|
| T3001 | TF0402B04P03 | TRANSFORMER | |
| T3002 | TF0402B04P03 | TRANSFORMER | |
| | | CRYSTALS/FILTERS | |
| X001 | A1100005BD | CRYSTAL | |
| | | OTHERS | |
| TNR001 | ENG36621G | TUNER | ⚠ |
| 1 | A51QDX992X | 20 INCH CRT<br>CT-20SL13G | ⚠ |
| | A60LUQ085X | 24 INCH CRT<br>CT-24SL13G CT-24SL13UG | ⚠ |
| M001 | TJSC00300 | CRT SOCKET<br>CT-20SL13G | ⚠ |
| | TJS2AC00401 | CRT SOCKET<br>CT-24SL13G CT-24SL13UG | ⚠ |
| 2 | TLY2AA028 | DEFLECTION YOKE<br>CT-20SL13G | ⚠ |
| | TLY2AA029 | DEFLECTION YOKE WITH CONV & PURITY RINGS<br>CT-24SL13G CT-24SL13UG | ⚠ |
| 3 | TXF3A01BA3 | DAG GND<br>CT-20SL13G | |
| | TXF3A01DB3 | DAG GND<br>CT-24SL13G CT-24SL13UG | |
| 4 | TSP2AA023 | DEGAUSSING COIL<br>CT-24SL13G CT-24SL13UG | ⚠ |
| | TSP2AA029 | DEGAUSSING COIL<br>CT-20SL13G | ⚠ |
| 5 | JH291U-009 | CONVERGENCE & PURITY RINGS<br>CT-20SL13G | |
| 6 | EASG12D552C2 | SPEAKER | |
| M002 | TXFKP13GSER | SPEAKER BRACKET | |
| 7 | TBX2AA0211 | 7-KEY BUTTON | |
| 8 | TKP2AA0842S | FRONT DOOR<br>CT-20SL13G | |
| | TKP2AA0832S | FRONT DOOR<br>CT-24SL13G CT-24SL13UG | |
| 9 | TEK6935 | DOOR CATCH | |
| 10 | TKX2AA0135 | IR GUIDE<br>CT-24SL13G CT-24SL13UG | |
| | TKX2AA0136 | IR GUIDE<br>CT-20SL13G | |
| M003 | 0FMK014ZZ | CONVERGENCE CORRECTOR STRIP | |
| M004 | TSN63115-4 | PURITY MAGNET | |
| M005 | TSX2AA0361 | AC LINE CORD | ⚠ |
| 11 | TXFKY27GSER | FRONT CABINET<br>CT-20SL13G | |
| | TXFKY28GSER | FRONT CABINET<br>CT-24SL13G CT-24SL13UG | |
| 12 | TXFKU18GSER | BACK CABINET<br>CT-20SL13G | |
| | TXFKU19GSER | BACK CABINET<br>CT-24SL13G CT-24SL13UG | |
| JK3001 | TJB2AA0221 | 8 PIN A/V JACK | |
| JK3002 | TJB2AA0045 | FRONT A/V JACK | |
| JK3003 | TJB2AA0421 | S-VIDEO JACK | |
| JK3004 | TJB2AA0211-1 | 2 PIN AUDIO OUT JACK | |
| | | OTHER ACCESSORIES | |
| M006 | EUR7613Z60 | REMOTE CONTROL | |
| M007 | UR76EC0303D | REMOTE CONTROL BATTERY COVER | |
| M008 | TQB2AA0454 | OWNER'S MANUAL | |